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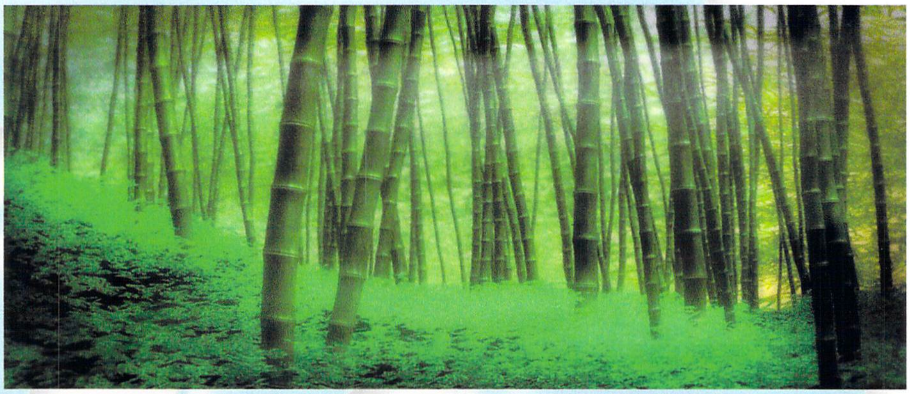
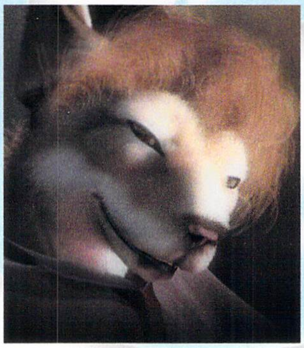


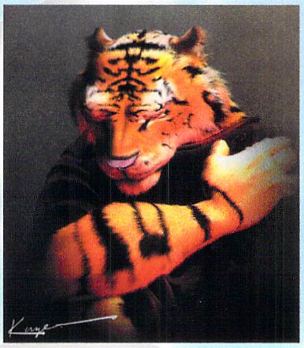
"*Kaze, Ghost Warrior* was made, in part to blow away the idea that feature-quality CGI needs to be expensive, it doesn't."

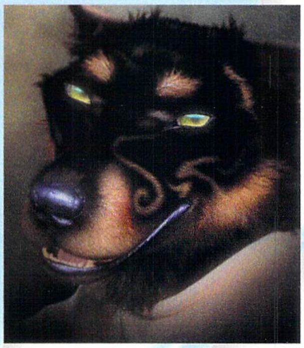
"I came back to LightWave with renewed respect after delving deeply into learning other 3D programs, having seen just how much LightWave is capable of, how much creative freedom it affords and how rare it is that software actually delivers on what it promises."

"LightWave is able to give me the dependability and out-the-box usability I need not to frustrate me when subjected to the pressures of my production methods."

—Timothy Albee
Producer, Writer, Director, Animator,
Kaze, Ghost Warrior
www.newtek.com/ghostwarrior







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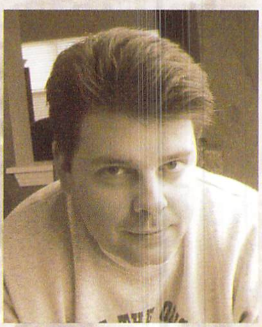
from Dan Ablan

I've always heard that "good things come to those who wait." Have you heard this?

Well, this issue, I'm here to tell you that waiting sucks. That's right, it's no good. I don't like waiting in line, I don't like waiting to get paid, and I don't like waiting for my new software to arrive!



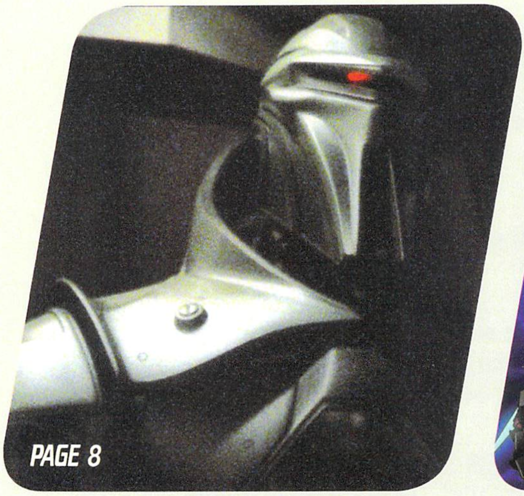
Many of you, I'm sure, have been eagerly awaiting your LightWave 8 upgrades. The original release from NewTek was scheduled for the end of 2003, and as you well know, that didn't happen. You see, there's a timeframe that marketing likes, and a timeframe that the developers like. Somewhere in the middle is the actual release date. I've read the forums, the newsgroups, and hundreds of e-mails with questions about LightWave 8, its release, the future of NewTek, blagh, blagh, blagh. It's truly amazing what people speculate when there's no information. But let me set the record straight – LightWave 8 is great. That's it! It's clearly the best LightWave release I've ever seen, and you'll agree once you begin working through the newly designed interface, embracing the updated workflow. You'll find the new arrangement of tools a huge plus, and will be thrilled with the new tools throughout Modeler and Layout.

So then you're probably asking – why the delay? I have to say, I'm glad that NewTek waited to release LightWave 8. The development team has made tremendous strides in making this release tight and powerful. Rather than releasing a not-so-perfect version, they took the extra months and made the software even better. In retrospect, maybe waiting isn't so bad?

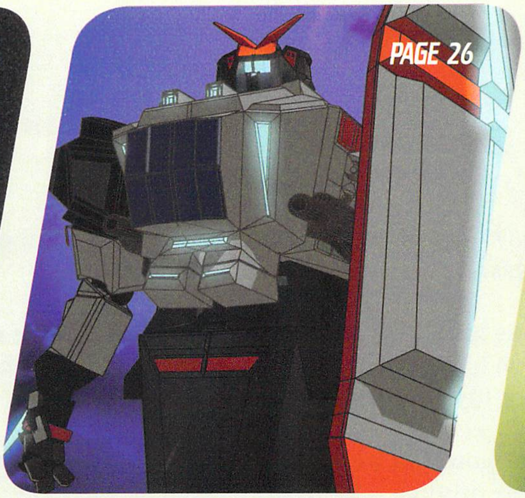
Dan Ablan

CONTENTS

contents



PAGE 8



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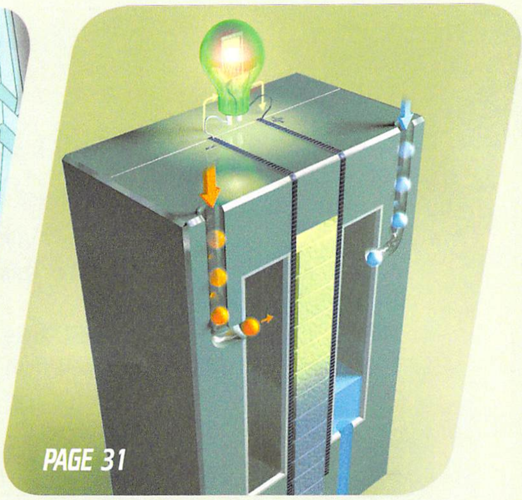


PAGE 31

departments

56 **FINAL RENDER**
Sleep? What's That?
BY BRAD CARVEY

tutorials

4 **LIGHTWAVE ESSENTIALS**
The Computer Ate My Homework. Project Management Tips
BY BRAD CARVEY

16 **UV TEXTURING AND SURFACING IN LIGHTWAVE 7.5 AND PHOTOSHOP 7 (PT 2)**
The continuing tutorial for creating realistic texturing of an Airbus
BY GREGORY GLEZAKOS

26 **CEL-SHADING**
The art of creating animations with a more "hand-drawn" feel
BY HUNTER WOLF

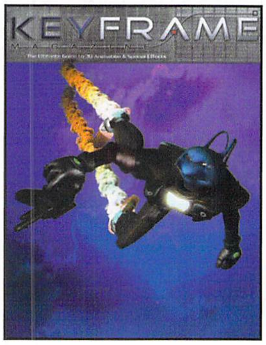
31 **CREATING NEWSPAPER GRAPHICS**
Creating Information Graphics for Newspapers
BY JEMAL BRINSON

38 **SIMPLE AS IT GETS: EXPRESSIONS**
No need to fear Expressions. A Quick & Easy way to use them
BY ERIC CHARD

42 **TALES FROM THE PRINT SIDE**
Print is everywhere and that means there is plenty of work to be had
BY BRAD KRAUSE

48 **PHOTOSHOP TEXTURES**
Creating custom animated brushes in Photoshop for original textures for your LightWave projects
BY STEPHEN M. BURNS

ABOUT THE COVER



Cover art by Hunter Wolf

Title: Zero Hour • **Artwork by:** Hunter Wolf

Software: LightWave 7.5c, Adobe Photoshop 7

Black Zero: Mercenary Ant patrols the night skies over the city of Sheath. Wherever the evil R.O.A.C.H. Corporation rears its antennaed head, Zero will be there, to strike them down. When the bad guys see Zero, their time is up!

How it was made: Zero was built in Modeler, rigged with Skelegons and brought into Layout. Textures for his face and armor were painted in Photoshop and mapped with the Surface Editor. The jet exhausts were created using particle emitters, with lights parented to each boot. A lens flare was applied to the boot lights to make the exhausts come to life. To add more drama to the scene, the camera focal zoom was set to 2.5. The ant is dangerous, the ant is bad. Cha mon.

Black Zero: Mercenary Ant is © 2004 Dwayne J. Ferguson

reviews

14 **FPRIME**

Worley Lab's brilliantly created plug-in for LightWave

REVIEW BY DAN ABLAN

features

8 **BATTLESTAR GALACTICA**

A behind the scenes look at the incredible CG work done for the new mini-series

BY EMILE EDWIN SMITH

36 **LEARNING THE ROPES OF FILM PRODUCTION**

What defines a producer's job

BY AKIKO ASHLEY & ABBY PIPER

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Issue Number 38 • May/June 2004

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LIGHTWAVE ESSENTIALS

"THE COMPUTER ATE MY HOMEWORK"

BY BRAD CARVEY

I remember the days when computers were analog. Computers were programmed to display a 3D animation by arranging physical components like transistors, resistors, inductors and capacitors on a patch panel. Since there were lots of components with a limited number of values, stored in bins, it was generally easy to find what you needed. Today, with digital computers, graphics projects can contain hundreds of unique files. Not only is the need for organization paramount, but storing of files in folders is less intuitive than placing resistors in a box. Losing or misplacing files has become a common problem with computer users.

Every semester, I have a few students who just don't seem to grasp the concept of storing files in folders on a computer. Surprisingly, this does not seem to be related to their intelligence or graphics abilities. Even some very good animators with years of computer experience have trouble storing and retrieving files. A common student complaint is, "I put the file in the objects folder and it was there a minute ago. The computer lost it." Eventually, we find it on a network drive or local zip drive. Sort of like "The dog ate my homework" excuse, except in this case, it's "The computer ate my homework."

To eliminate, or at least ease, this problem takes organization. Left to their own devices, most students come up with their own ways of dealing with how to organize their files. However, as a teacher, I have had to whack my way through all those unique systems. I now require everyone to use the system that I have developed for my own projects.

CREATING A BLANK PROJECT

Your first step to becoming organized is to create a Blank Project. This blank project is like a template for all projects. It contains the folders that you will need to store project files in, so that you keep the various scenes and their components separate.

To create this directory structure:

1. Create a new Folder and rename it *BlankProject.*

2. Navigate inside the *BlankProject.* Create the following folders inside it:
   - * Assemblies
   - * Audio
   - * Envelopes
   - * Frames
   - * Images
   - * Motions
   - * Movies
   - * Objects
   - * Scenes
   - * Splines
   - * Surfaces
   - * Temp

3. Be sure to enter the names exactly as shown. Be sure they are capitalized. They should all be at the same directory level. Don't create one inside the other.

4. The next step is to create a Blank Scene file within the Scenes folder. In LightWave Layout, set up the scene as indicated:
   - * Add a Null.
   - * Add two Distant lights.
   - * Parent the lights (including the default light) to the Null.
   - * Position each light so that the three are set up as a standard three-light arrangement.
   - * Change some of LightWave's default settings:
     - * ***Camera*** Lens Focal Length from 20 mm to 35 mm.
     - * ***Lights*** Ambient light intensity form 25% to 8%.
     - * ***Display Options*** OpenGL Texture resolution to 1024 x 1024.
     - * ***General Options*** Enable Play at Exact Rate.
     - * Move the camera above the ground level and create a keyframe.
     - * ***Camera Item Properties*** Segment Memory Limit to 64 MB.

CREATING A NEW PROJECT

Whenever you start a new project, do not save your files in the BlankProject folder or its subdirectories. Instead, create a new project folder as follows:

1. Select the *BlankProject* folder with the right mouse button. From the pull down menu, select *Copy*. Deselect the folder by clicking in a blank spot below it.

2. In a blank spot, click with the right mouse button and select ***Paste.*** A new folder will appear named ***copy of BlankProject.*** It will contain all the subdirectories that were in the original. Give the folder a new name that describes the new project.

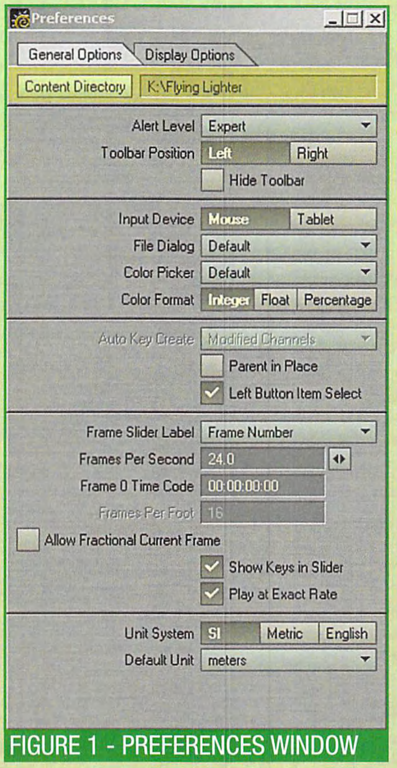
3. Open LightWave Layout and set the Content Directory (under General Options) to the new project folder (**Figure 1**). This makes sure that LightWave will automatically look for scenes and other items in the appropriate folders.

4. Open the blank Scenes folder, and load the blank scene file. Make any changes that are specific to the new project, and save the new scene file. Whenever you are starting a new scene, always load the blank scene file first.

You are now ready to start work on your new project.

Note: When you use a file that is external to your project folder, use Explorer to copy it to the appropriate folder in your new project. For example, if a texture needs a reflection map, don't just reference it from the LightWave Images Directory, move or copy it to your projects image directory first. This may seem like a waste of space, but when you backup your project, everything you need will be included in one place. Also, this eliminates the problem of missing files, which can occur when a file external to the project gets moved or deleted.

It is a good idea to keep notes about what you are doing. I use a new notepad for every project. I try to write everything down that may be helpful (if I need to figure out why I did something), and important information related to the project, like client addresses/phone numbers, or deadlines.



Content Directory K:\Flying Lighter
Alert Level: Expert
Toolbar Position: Left | Right
☐ Hide Toolbar
Input Device: Mouse | Tablet
File Dialog: Default
Color Picker: Default
Color Format: Integer | Float | Percentage
Auto Key Create: Modified Channels
☐ Parent in Place
☑ Left Button Item Select
Frame Slider Label: Frame Number
Frames Per Second: 24.0
Frame 0 Time Code: 00:00:00:00
Frames Per Foot: 16
☐ Allow Fractional Current Frame
☑ Show Keys in Slider
☑ Play at Exact Rate
Unit System: SI | Metric | English
Default Unit: meters

FIGURE 1 - PREFERENCES WINDOW

SAVING AND NAMING FILES

I name files that change versions frequently, such as scene files and object files, with the date and revision numbers embedded in the file name.

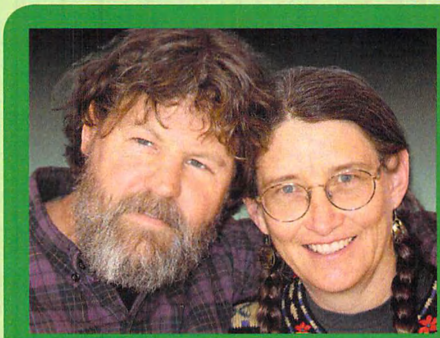
For example:
Road_29Jan_01.lws
(29Jan is the date; 01 is the version not the year)
BeachBall_02Feb_01.lwo
BeachBall_03Feb_02.lwo

Other files, like image files, which don't change often, may have just a revision number included with the file name.

For example:
Japan_01.jpg
RollingBall_03.tga
BallBouncing_01.avi

The reason I put the date in the file name is because of problems I have seen in which the date changes when the files are moved from one computer to another. When the date and version are included in the name, it is easy to identify which files are most current. Months later, when working with an old project, it is easy to determine which files need to be used.

There are many strategies for organizing animation projects; however, using these three tools: the Blank Project template, setting the Content Directory, and naming files with embedded dates and version numbers, will enable you to become more organized and efficient and much less vulnerable to the appetite of the computer. 🟥



BRAD CARVEY HAS BEEN DOING COMPUTER ANIMATIONS FOR A LONG TIME. IN 1969, BRAD USED AN ANALOG COMPUTER, WHICH WAS THE SIZE OF A CAR, TO PRODUCE HIS FIRST COMPUTER ANIMATION. BRAD IS AN ELECTRICAL ENGINEER AND AN EMMY AWARD-WINNING MEMBER OF THE VIDEO TOASTER DEVELOPMENT TEAM. HE PREFERS TO DO FEATURE FILM WORK. HIS CREDITS INCLUDE FILMS LIKE "MEN IN BLACK," "STUART LITTLE," "BLACK HAWK DOWN," "KATE & LEOPOLD" AND "MASTER OF DISGUISE."

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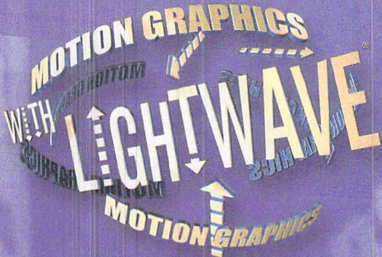

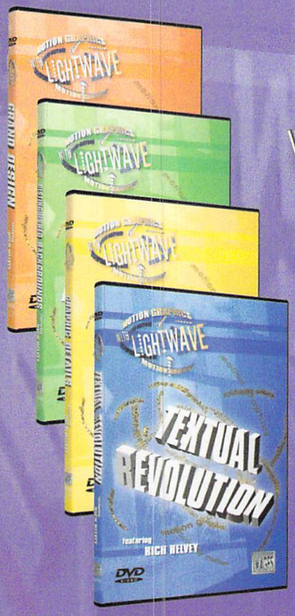

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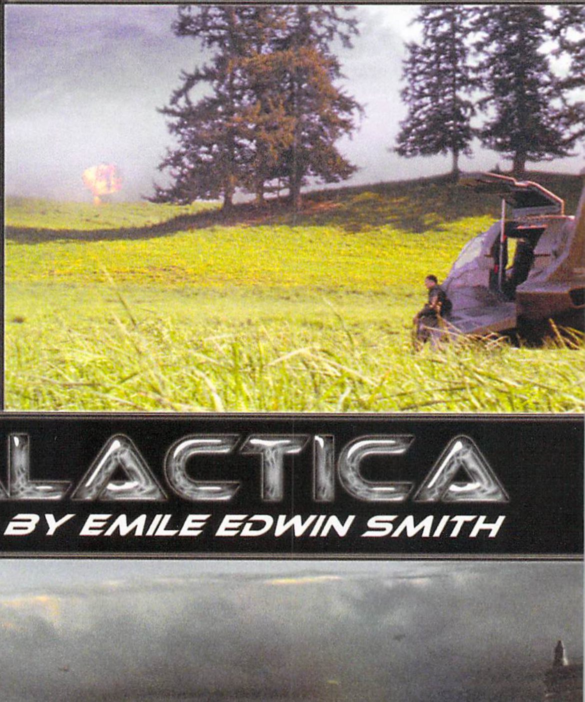
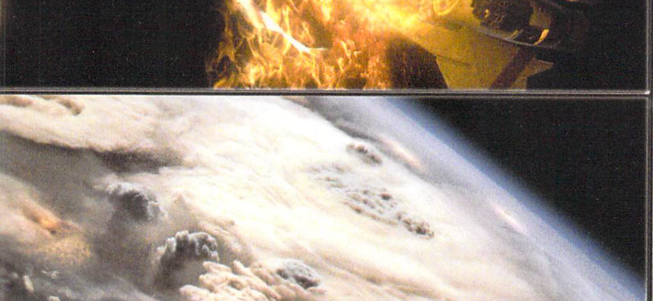
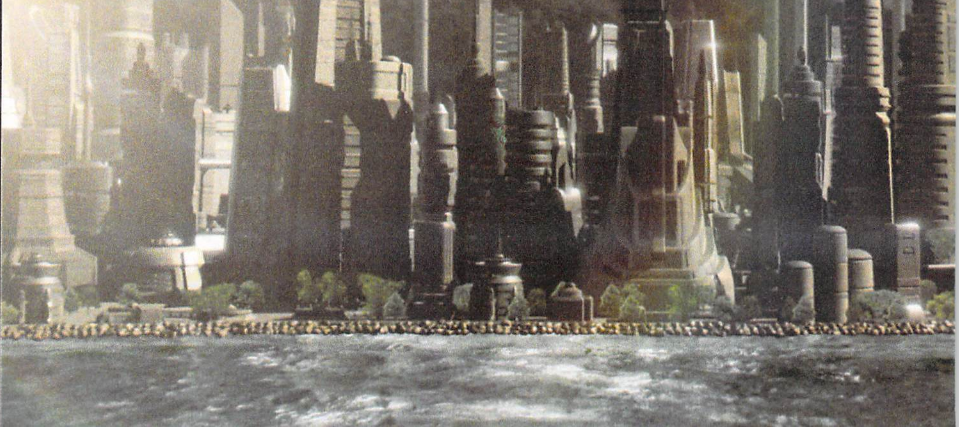
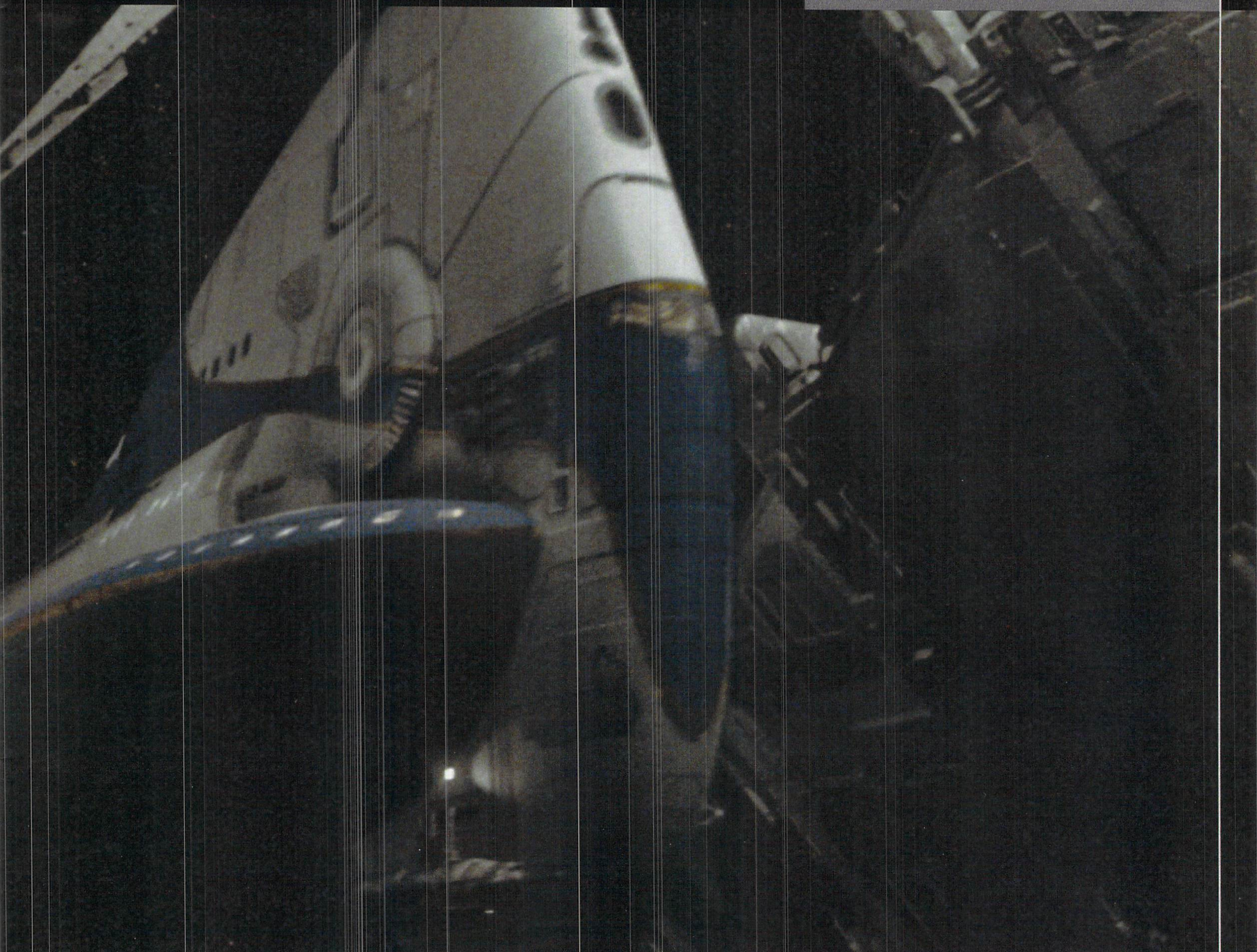


BATTLESTAR GALACTICA

BY EMILE EDWIN SMITH

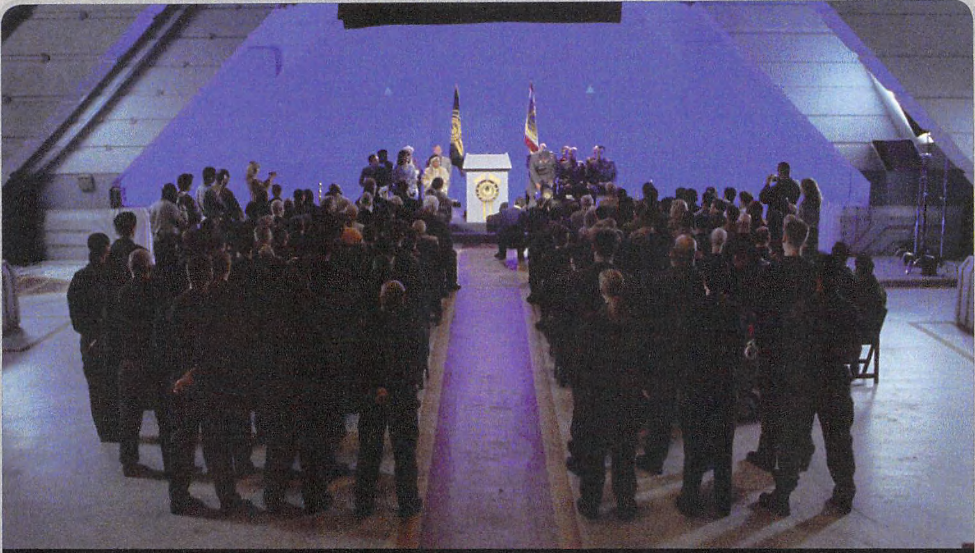




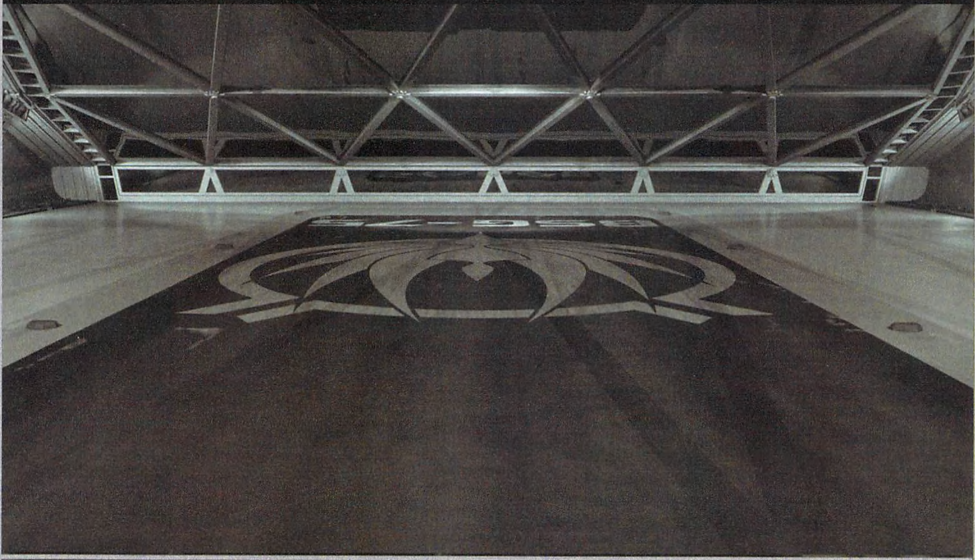


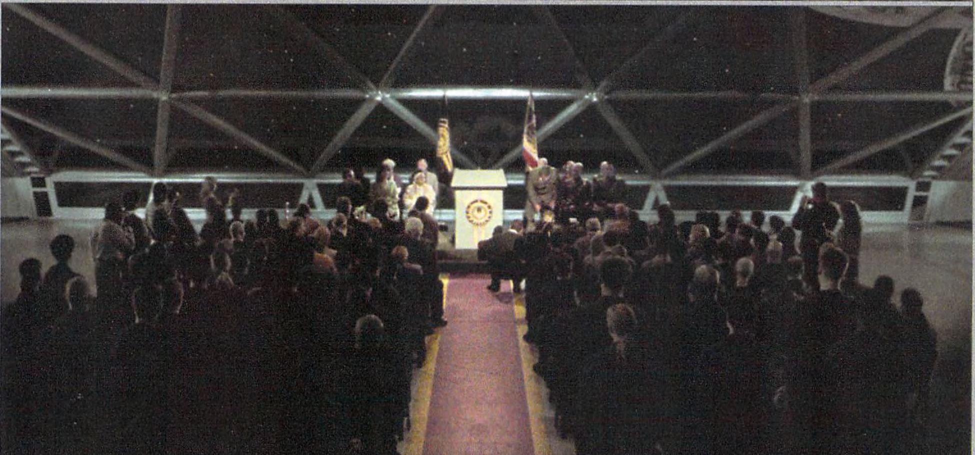
BEING INVOLVED IN A PROJECT THAT I HAD LOVED ON TV WHEN I WAS A KID GROWING UP WAS A GREAT FEELING. MANY SHOWS HAD THEIR INFLUENCE ON ME, BUT IN THE TV GENRE, "BATTLESTAR GALACTICA" WAS THE MOST DEFINING IN MY EVENTUAL CAREER PATH.

ONE OF THE DEFINING CHARACTERISTICS OF GALACTICA WAS THE DESIRE OF RON MOORE AND GARY HUTZEL TO HAVE A HANDHELD STYLE TO THE CAMERA WORK. I HAVE DONE THIS BEFORE, AND ALSO DONE IT WITH MANY OF THE SAME CREW AT ZOIC STUDIOS ON "FIREFLY," BUT WE DROVE



AN EXAMPLE OF THE SET EXTENSIONS UTILIZED IN "BATTLESTAR GALACTICA" – THE BLUE SCREEN SHOT (ABOVE) WAS COMPOSITED WITH THE CGI HALL (BELOW) TO CREATE THE FINAL COMPOSITED IMAGE (BELOW)

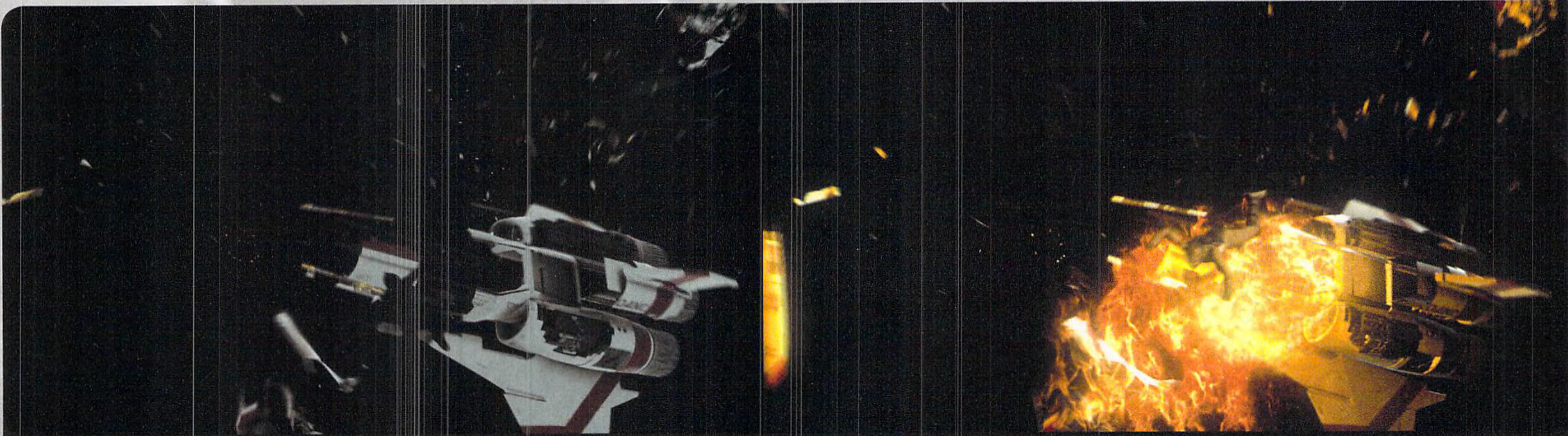




the show a bit differently with it here. In all CG shots, we never left the live action to "cut away" to a spaceship firing. It was always a justified move to a new scene, location, etc., instead of just "people talking, cut to outside." We had the dialogue and camera work motivate those transitions. We wanted to make sure that the VFX, while eye-catching, also moved the story forward and were not just eye candy. We wanted to keep you in the story, not draw you out to see a pretty spaceship, then cut inside for a line of dialogue. We wanted to have everything tied together in a very cohesive way, which we could not have done without the extensive previz we did.

What drove this was an idea new to visual effects production on a TV schedule, and not very common on features. We were able to basically create a set of animatics daily for the editors to use and cut into the show as they got the live action and worked on the cut of the show. The takes the editors get every day of live action are called "dailies," and are basically the live action scenes that have been shot the day before. We were delivering them what we called digital dailies, which contained animatics of the previous couple of days work. This process worked extremely well, and allowed for a very dynamic way of executing the working cut of the show. The editor was able to see what we were trying to get across without having to wait months down the line; therefore, he was able to adjust the cut to make room for very cool ideas. The director was able to see what we were doing and take this into account on the shooting of the corresponding scenes. This also allowed the director to have a lot of input before shots had gone too far along to be easily changed, and it gave us the ability to adjust our shots to tell his story better.

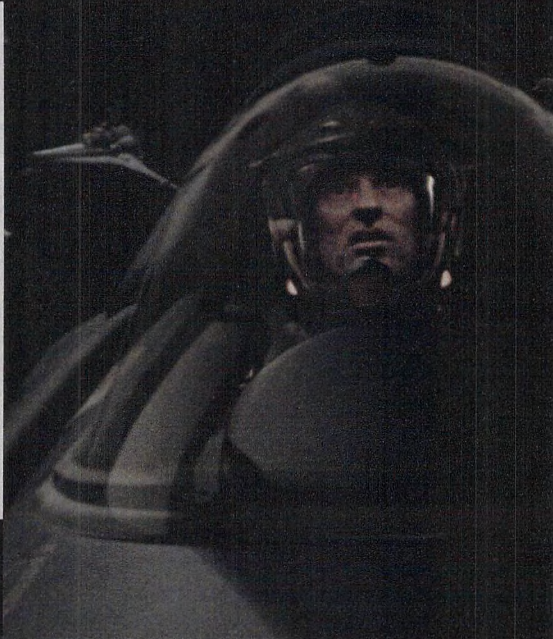
Set extensions were a huge part of this process as well. Production could not afford to build the full-scale sets they wanted, specifically the hangar bay of the Galactica, so we built digital



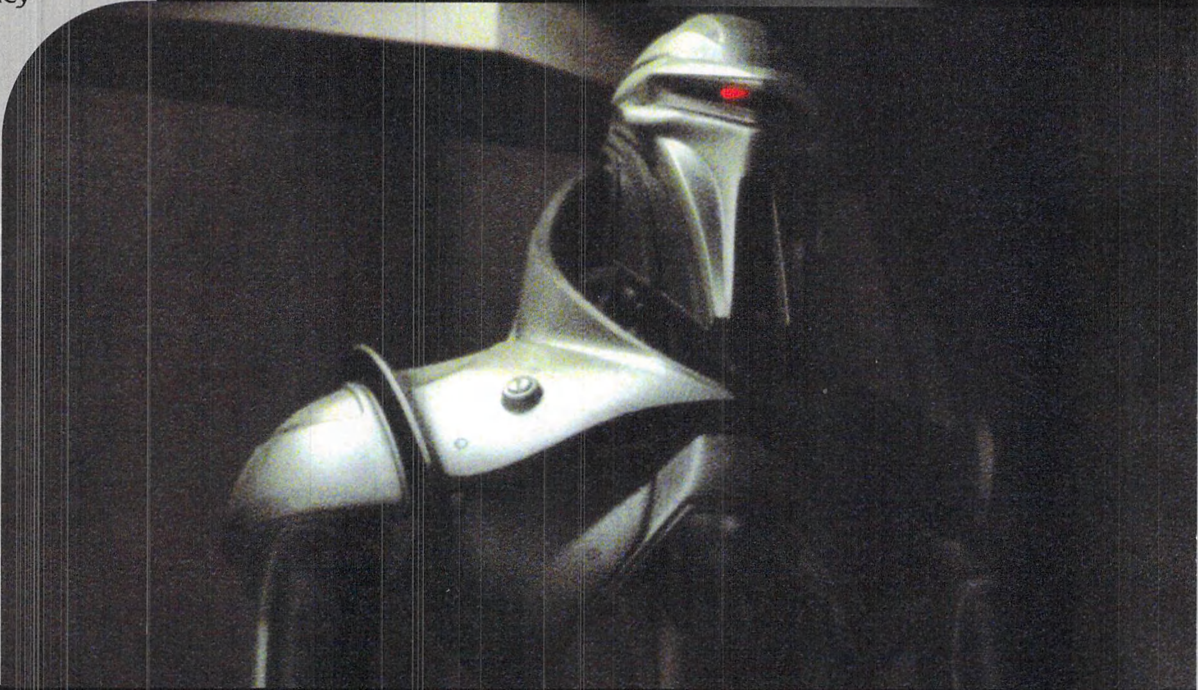
BATTLE SEQUENCES WERE HIGHLIGHTED WITH EXPLOSIONS THAT SHOWED THE CRAFT BEING TORN APART RATHER THAN SIMPLY EXPLODING

extensions, and in a fair number of shots, extended it out to feel as if it were roughly a mile long. We shot various elements of people to layer in the shots and added Vipers, gear, etc. to make it feel alive. Another item they could not build was a complete Mark VII Viper. They could only build the front half of it, so anytime you see the back half, it is either a set extension or, in many cases, we completely removed the actors and dropped them in an all-CG version of the ship, eliminating the real thing altogether. This was a great bonus, as it eliminated the limitations of shooting around a full-size prop.

For the battle scenes, we wanted the viewer to feel like they were watching what another Viper pilot was seeing. Aesthetically it was more, "Saving Private Ryan" or "Black Hawk Down" than "Star Trek." That's not to say that "Star Trek" is bad by any means, it just has its own style, such that we created a style for Galactica all her own. For example, Michael Rymer and Ron Moore both wanted a different look for when the ships exploded, much more along the lines of a ship getting ripped apart by shrapnel from a missile as opposed to exploding into a big fireball. We took elements that Gary had shot of propane balloons being sucked up into a black funnel to get the look like the fire was being extinguished immediately in the vacuum of space. We expanded upon this by taking these elements and mapping them on volumetrics, which gave them much more depth, and they breathed a whole new life into the explosion scenes. It gave us the advantages of digital fire, while getting the look of a real fire element, which is an incredible advantage to the show.



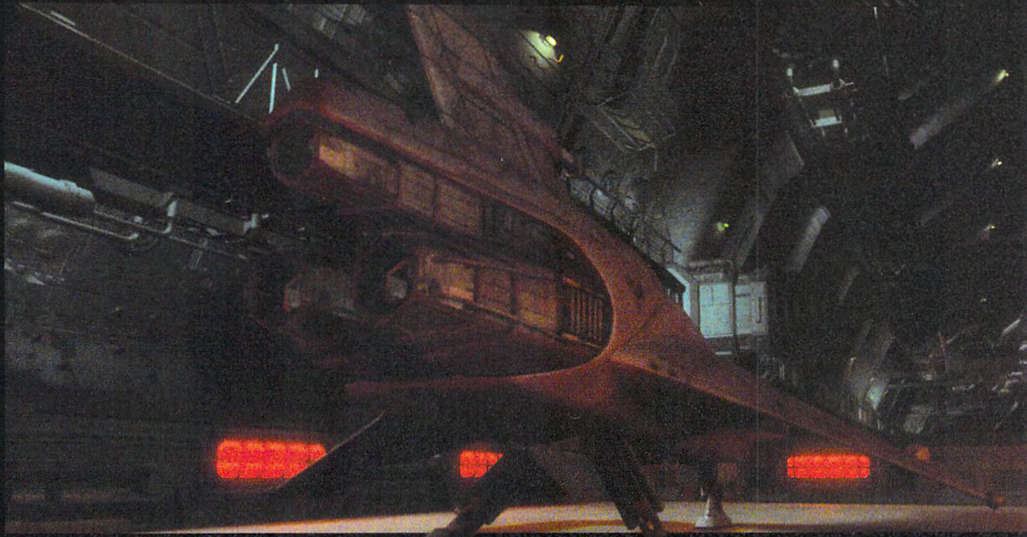
THE CYLONS (BELOW) WERE UPDATED FOR A MORE OMINOUS LOOK THAN THEIR PREDECESSORS



For a show of this scope and size we kept our number of artists to a reasonable level of extremely talented people, then towards the end ramped up production with the addition of a few more people to fill in any gaps. In the end, we had a thoroughly enjoyable product we were all happy to have worked on.

THE BATTLESTAR GALACTICA TEAM:

GARY HUTZEL – *VISUAL EFFECTS SUPERVISOR*
EMILE EDWIN SMITH – *DIGITAL EFFECTS SUPERVISOR*
LEE STRINGER – *CG SUPERVISOR*
KYLE TOUCHER – *CG ARTIST*
JARROD DAVIS – *CG ARTIST*
ARAM GRANGER – *CG ARTIST*
KEVIN QUATTRO – *CG ARTIST*
MARK SHIMER – *CG ARTIST*
PJ FOLEY – *CG ARTIST*
ROB BALDWIN – *CG ARTIST*
RACHEL KEYTE – *ARTIST*
PATTI GANNON – *COMPOSITING SUPERVISOR*
CHRIS JONES – *COMPOSITOR*
SEAN APPLE – *COMPOSITOR*
STEVE MEYER – *COMPOSITOR*



Keep an eye out for more behind the scenes insight on "Battlestar Galactica" coming soon!

EMILE EDWIN SMITH IS A VISUAL EFFECTS SUPERVISOR AT ZOIC STUDIOS WHO LED THE TEAMS ON SUCH RECENT PROJECTS AS "CENTURY CITY," "BATTLESTAR GALACTICA," "FIREFLY" AND "NYPD 2069." EMILE WON THE EMMY AND VES AWARD FOR "FIREFLY" IN 2003 AND THE VES AWARD FOR "BATTLESTAR GALACTICA" IN 2004. PRIOR TO ZOIC, EMILE WORKED AS A VISUAL EFFECTS SUPERVISOR, DIRECTOR AND ARTIST WITH SUCH COMPANIES AS FOUNDATION IMAGING, RADIUM, NEO PICTURES AND FLASH FILM WORKS ON VARIOUS PROJECTS SUCH AS THE VFX SUPERVISOR FOR THE TV MOVIE, "EXTREME TEAM," FOR TOUCHSTONE TELEVISION, WAS VISUAL EFFECTS SUPERVISOR FOR "PROVIDENCE," AND SERVED AS DIGITAL EFFECTS SUPERVISOR ON THE TV MOVIE "SUPERFIRE." HE HAS ENJOYED CONTRIBUTING HIS VISUAL EFFECTS EXPERIENCE TO SUCH SHOWS AS "MIRACLES," "THE TWILIGHT ZONE," "BUFFY THE VAMPIRE SLAYER," "STAR TREK: VOYAGER" AND "DEEP SPACE 9." ALSO LISTED AMONG HIS ACCOMPLISHMENTS, EMILE DIRECTED SEVERAL EPISODES OF "STARSHIP TROOPERS, THE ROUGHNECK CHRONICLES." CROSSING OVER INTO OTHER ARENAS, EMILE HAS WORKED ON FEATURE FILMS, SUCH AS "MIMIC 2" AND "THE JACKAL," AS WELL AS NUMEROUS COMMERCIALS AND MUSIC VIDEOS. BEFORE HIS ENTRY INTO THE REALM OF VISUAL EFFECTS, EMILE HONED HIS SKILLS WHILE ATTENDING FILM SCHOOL AND EARNING HIS B.A. FROM THE UNIVERSITY OF CALIFORNIA AT SAN DIEGO.

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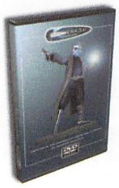

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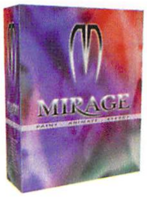

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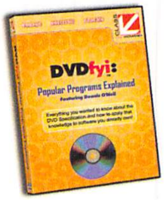

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FPRIME FROM WORLEY LABS

BY DAN ABLAN

ALTHOUGH IT IS VERY SIMPLE TO USE AND WORK WITH, FPRIME IS A BRILLIANTLY CREATED PLUG-IN FOR LIGHTWAVE. WORLEY LABS HAS HIT THE MARK.

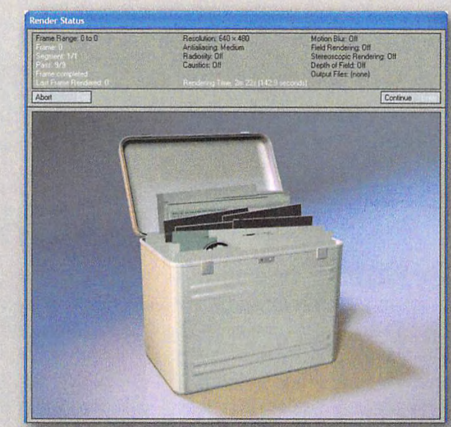
It's not often a new tool for LightWave is released that sends everyone reaching for their wallets. Steve Worley, the genius behind the famous plug-ins of Sasquatch, G2, and the Polk Collection has launched FPrime, a rendering engine with a unique design focus.

FPrime is about Speed

Different than LightWave's native renderer, FPrime is not just a final output step. Rather, it is your companion during the entire process of creating scenes in LightWave Layout. You can use FPrime from your initial setup, through texturing and lighting, keyframing, and, of course, final rendering. It revolutionizes workflow by giving you constant feedback about your current scene and the effect of changes. The bottom line with FPrime is that you can always just see your render.

FPrime was teased on the Worley.com website for a short while before its release. Surpisingly, like most of the Worley plug-ins, FPrime is very reasonably priced at $399. Many people were lucky enough to get in on a pre-release deal of $279, and within days, were able to download and use the plug-in.

So what's all the hype? Why the fuss? Let's take a look at this enormously time-saving tool. Figure 1 shows a fairly normal scene in LightWave, with some render intensive settings such as blurred reflections, ray-traced shadows, and ray-traced reflections. This render took 2 minutes and 22 seconds to render. Figure 2 shows the FPrime window with the same scene, and what you're looking at was virtually instant. That's right – the ray-traced reflections, blurring, and shadows show up in real time. The FPrime engine is constantly working and updating your image. It first shows a pixelated version and quickly sharpens.



Frame Range: 0 to 0
Frame: 0
Segment: 1/1
Pass: 9/9
Frame completed
Last Frame Rendered: 0
Resolution: 640 × 480
Antialiasing: Medium
Radiosity: Off
Caustics: Off
Rendering Time: 2m 22s (142.9 seconds)
Motion Blur: Off
Field Rendering: Off
Stereoscopic Rendering: Off
Depth of Field: Off
Output Files: (none)

FIGURE 1 - STANDARD LIGHTWAVE SCENE

FPrime is about Workflow

What I like about FPrime is that it's not just another type of VIPER. VIPER, as you might know, is LightWave's virtual interactive preview renderer. FPrime also saves sequences. What does that mean? That means renders that once took all day can now be done in a matter of minutes. But, FPrime's renderer is not just a simple sequence saver. It is designed with something Worley calls progressive refinement. As you see your preview image, and then go back to making surface, lighting, or motion changes in Layout, FPrime is continually increasing the quality of the image. You do not need to specify a quality setting for FPrime to work – it just does.

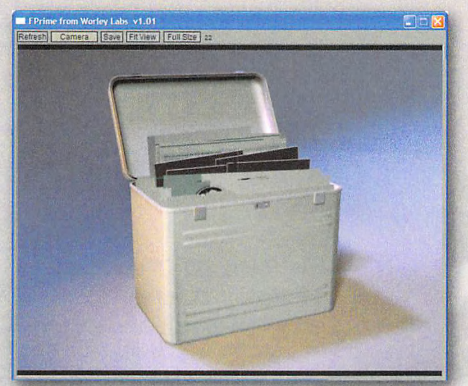


FIGURE 2 - THE FPRIME WINDOW WITH THE SAME SCENE FROM FIG. 1

Figure 3 shows how you can utilize FPrime in a normal everyday working environment. This image shows LightWave 8 with the main window squeezed down, the new Scene Editor open, Surface Editor, and FPrime. You can work this way throughout your scene and not disrupt your workflow. This particular scene from my "Inside LightWave 8" book uses an area light and heavy reflections. When surfacing a car, the reflection is key, and with render times reaching six or seven minutes per frame just to test, you can lose a lot of hours just "tweaking." But with FPrime, you can interactively change reflection parameters, lighting values, shadows and so on, and gain instant feedback. But there's more to it than this. Figure 4 shows FPrime's render panel. Here, you can set your frame range, level of refinement, and of course, file location. There are many users who have replaced LightWave's renderer

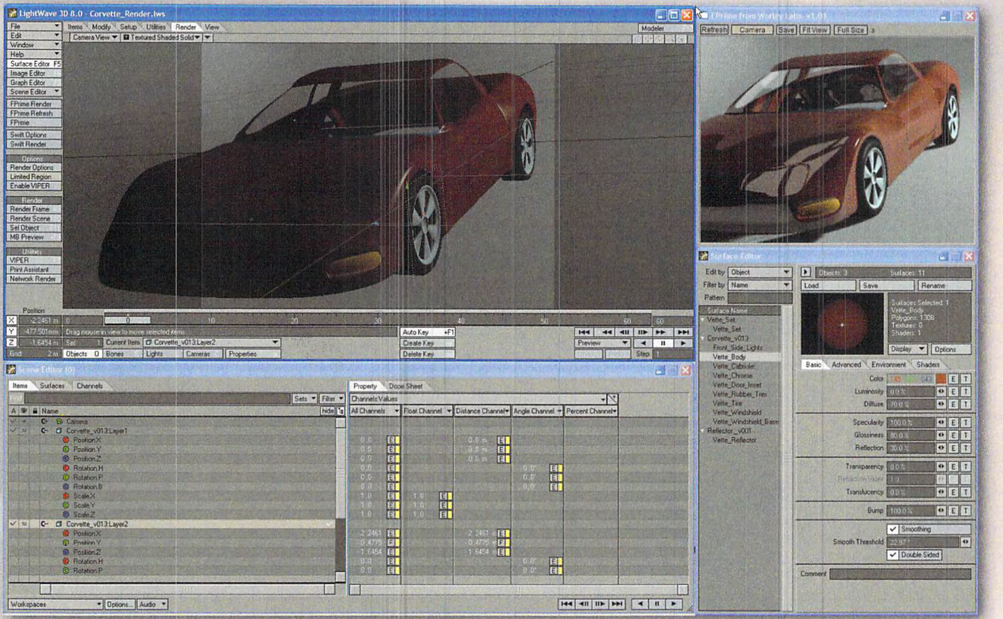
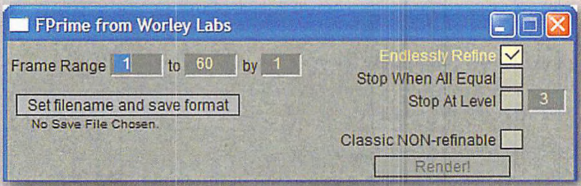


FIGURE 3 - A NORMAL WORKING ENVIRONMENT WITH FPRIME IN OPERATION



Frame Range 1 to 60 by 1

Endlessly Refine ☑

Stop When All Equal ☐

Stop At Level ☐ 3

Set filename and save format

No Save File Chosen.

Classic NON-refinable ☐

FIGURE 4 - THE FPRIME RENDER PANEL

for FPrime's, using this simple panel. What comes out of this panel is better than the interactive window.

FPrime, although simple to use and work with, is a brilliantly created plug-in for LightWave. It works on Mac or PC, LightWave 7 or 8. Do yourself a favor and visit www.worley.com to see some exciting examples of this tool in action. The Worley team has worked very hard on this killer tool, and they are excellent in responding to questions from customers.

NewTek and Worley labs will be working together in the future to enhance LightWave's software development kit, which will make not only the Worley FPrime plug-in even better, but all plug-ins. It's a great time to be a LightWaver! ■

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UV TEXTURING AND SURFACING IN LIGHTWAVE 7.5 AND PHOTOSHOP 7 (Part 2)

BY GREGORY GLEZAKOS

OLYMPIC
AIRBUS A320-200
SX-301 TREX
Gregory "T Rex" Glezakos
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INTRODUCTION

Hello and welcome back to the second part of a series of tutorials about creating UVs and painting textures for an airliner like the one above. More info about this image can be found here: http://www.cgtalk.com/showthread.php?s=&threadid=85367. (Note: Files referenced in this tutorial can be downloaded from the Resource Files page at www.keyframemag.com.)

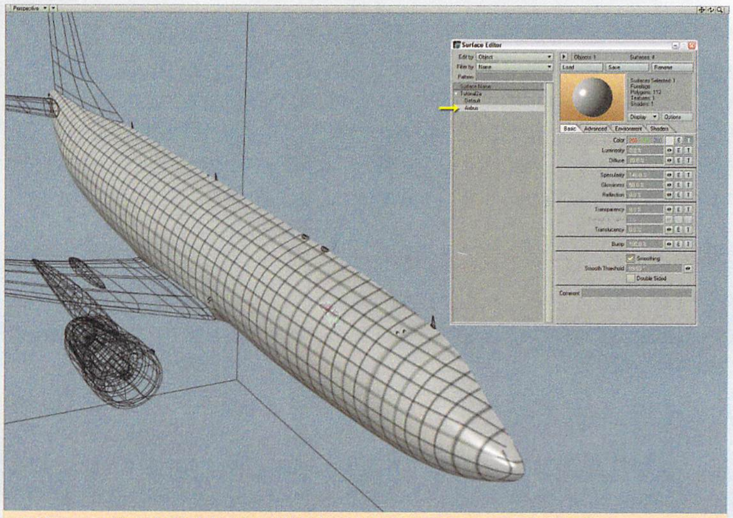
There will be three parts for the UV and morph map creation, instead of two as previously announced, and one or two more parts for painting the texture maps using Photoshop.

For those of you who lost the previous issue, consider ordering it online if you want to catch up with the pace. These lessons are somewhat "intermediate," so you really need all parts to understand them completely. You need to download the aircraft object, a grid map and some free l-scripts, which will help you along the tutorials, from www.keyframemag.com (click on "Resource Files.").

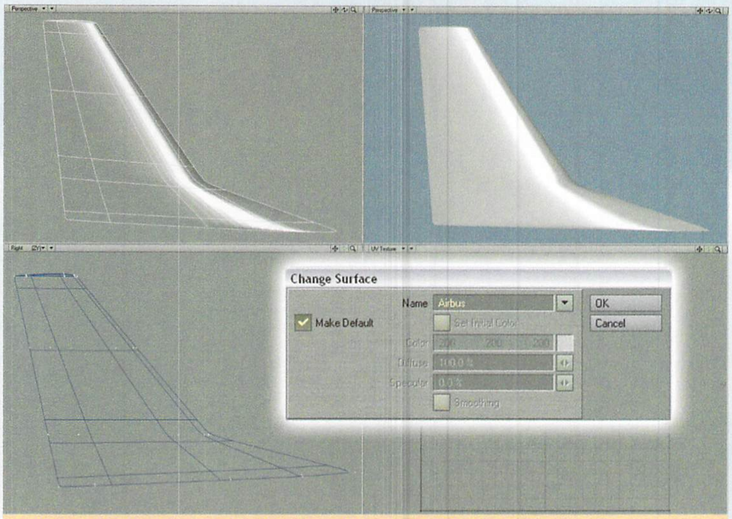
In this second part, we're going to create UVs for all the aircraft wings. Last time we created UVs for the fuselage. Even if you downloaded the files for Issue 37, you'll want to download the new files for 38, as the aircraft model has been updated with some modeling variations crucial for this second part, as well as the UVs we created in the first part. The download also includes a great and free plug-in called "V_Roll" from Pictrix. (Download files are listed by issue number on the Resource Files page at www.keyframemag.com.)

VERTICAL STABILIZER

In the first part, we created two surfaces for the fuselage, called "Airplane" and, for the other side, "Airplane Mirror." Dealing with textures for both sides of the aircraft is beyond the scope of these tutorials. So, as you see from the downloaded object, to make the process easier we've deleted half of the fuselage and now we have one surface for it, called "Airbus" (Pic1). We also renamed the "Fuselage_T" UV texture map to "Airbus_T," since this is going to be the one and only UV texture map for the whole airplane when we finish. Accordingly, we renamed the "Fuselage_M" morph map to "Airbus_M." We'll mirror-create the other side of the aircraft when we finish all the UVs and have a single layer object only.


Perspective
Surface Editor
Edit by Object
Filter by Name
Pattern
Surface Name
Default
Airbus
Objects 1
Surfaces 4
Load
Save
Rename
Surfaces Selected: 1
Fuselage
Polygons: 112
Textures: 1
Shaders: 1
Display
Options
Basic
Advanced
Environment
Shaders
Color
Luminosity
Diffuse
Specularity
Glossiness
Reflection
Transparency
Translucency
Bump
Smoothing
Smooth Threshold
Double Sided
Comment

PIC 1– OUR AIRBUS WITH HALF OF THE FUSELAGE DELETED


Change Surface

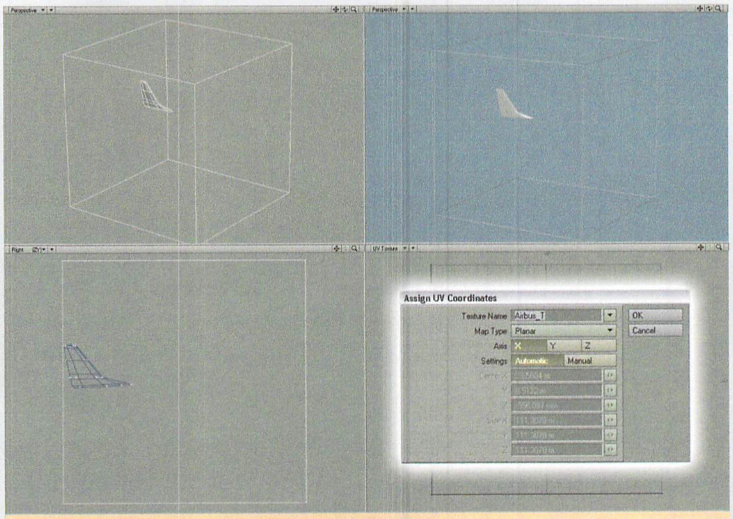
Name: Airbus

☑ Make Default

PIC 2– ASSIGNING THE "AIRBUS" SURFACE TO THE STABILIZER

Make the second layer the only active layer. Here we found the vertical stabilizer wing. Press "q" to assign the "Airbus" surface to this object, like in Pic2.

By default, the vertical stabilizer wing will produce distorted UVs, because its polygons are not so evenly spread. But, we'll use the two techniques we learned from the first part of this tutorial to produce distort-free textures. For the vertical wing, we'll create one texture that is the same for both its sides. Select as active layers the layers 2 and 9 (Vertical Stabilizer and Great Box). Under the Map tab, click the Make UVs button. The Assign UV Coordinates window pops up. Select the (only) "Airbus_T" map for Texture Name and choose for Map type "Planar" on "X" axis, like in Pic3. Leave the rest of the settings as default and hit OK.


Assign UV Coordinates

Texture Name: Airbus_T

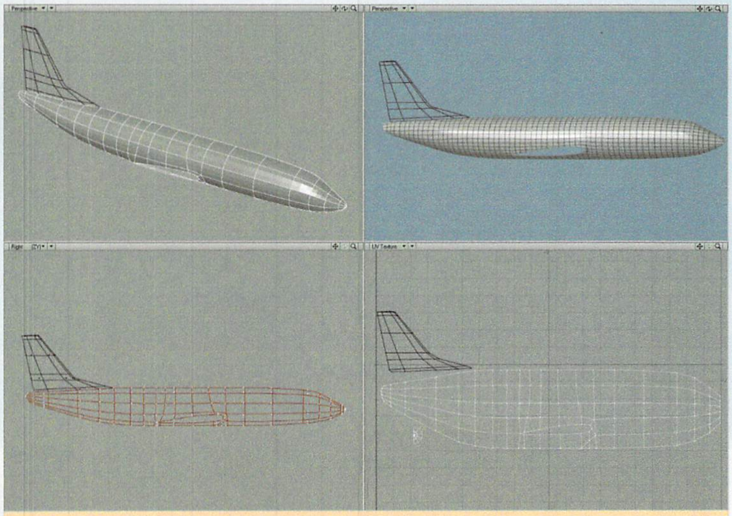
Map Type: Planar

Axis: X

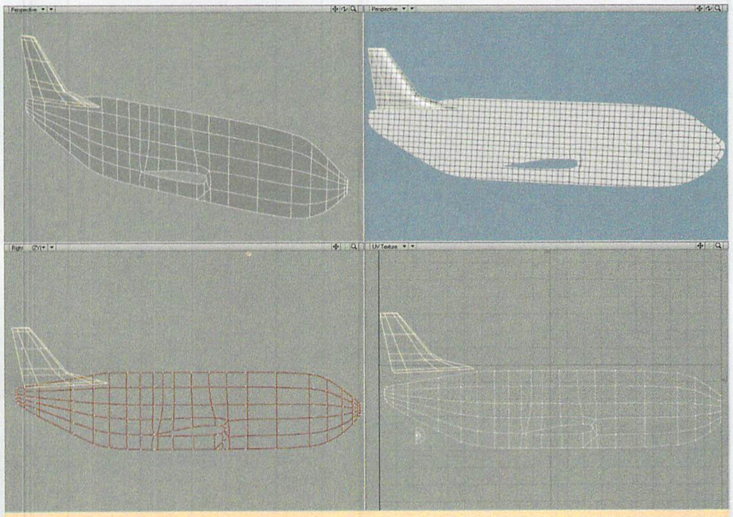
Settings: Automatic

PIC 3– ASSIGN COORDINATES WINDOW

As you see, the mapping on the vertical wing is distorted. This was expected, but we are okay with this, since our "Front-Projection UVs" technique is distort-free proof. Let's move on. Select layer 1 as the foreground layer and layer 2 as the background. You'll notice that the UVs for the vertical stabilizer overlap the fuselage's "Airbus_T" UVs. We must fix this, because for our case we want to use only one texture/surface for the whole airplane and not different textures and surface names. So, press "Ctrl + u" to un-weld all points and in the UV Texture window, move all the "Airbus_T" UVs together downwards, just to clear the overlapping with the UVs of the vertical wing, like in Pic4. After that, merge back all points. Now, each time we finish the UVs for a given part, we'll move it back to layer 1 until we have a single-layer airplane.



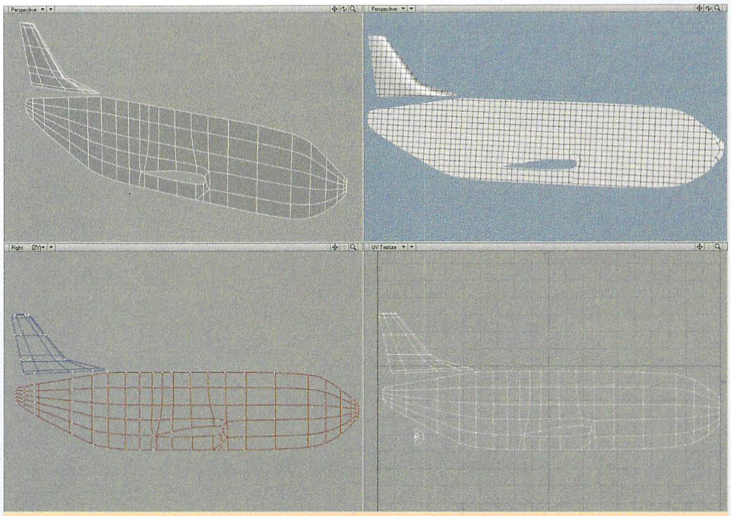
PIC 4– ALL "AIRBUS_T" UV'S MOVED DOWN TO CLEAR



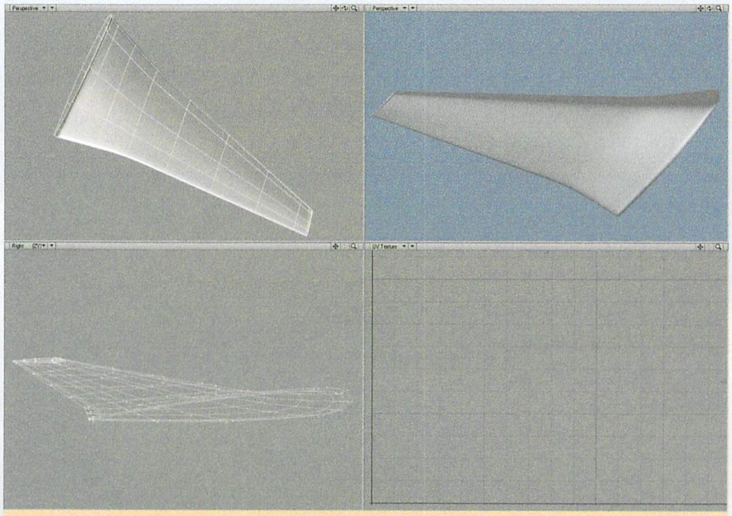
PIC 5– THE "AIRBUS_M" MAP

So, go to layer 2, cut all of the polygons and paste them back to layer 1. Normally, we should merge the points for all the parts we paste in layer 1, but we will not do so until we finish all the work in Layout for the "Front-Projection UVs" technique, because we need the morph maps intact. What we want to do is every time we bring a new part that has a morph map in layer 1, add its map to the layer's "Airbus_M" morph map, which eventually will become a single big morph map for the whole aircraft. Because the vertical wing is obscuring the "Airbus_M" map (Pic5), we have to move it out of the way.

Select all of the vertical wing's polygons and in the Right view move them upwards, just enough to eliminate overlapping of the fuselage, like in Pic6. Then flatten the vertical wing on the X-axis with a value of "0 m." Now, let's move on to the main wing of the aircraft (Pic7).



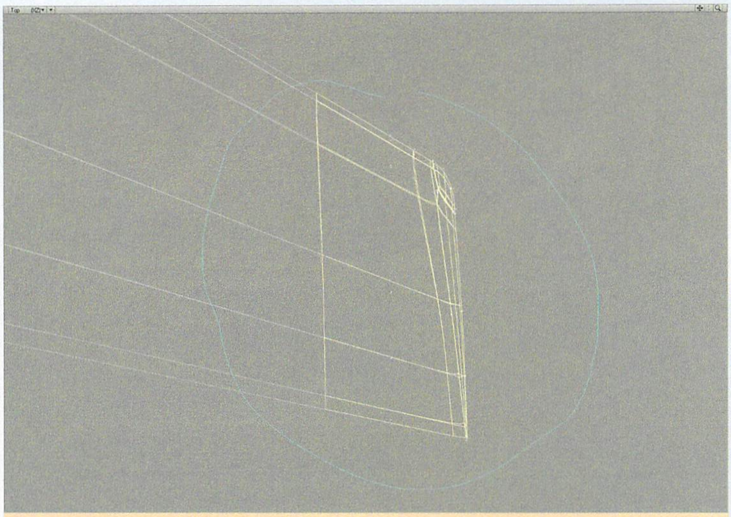
PIC 6– ELIMINATE OVERLAPPING OF WING OVER FUSELAGE



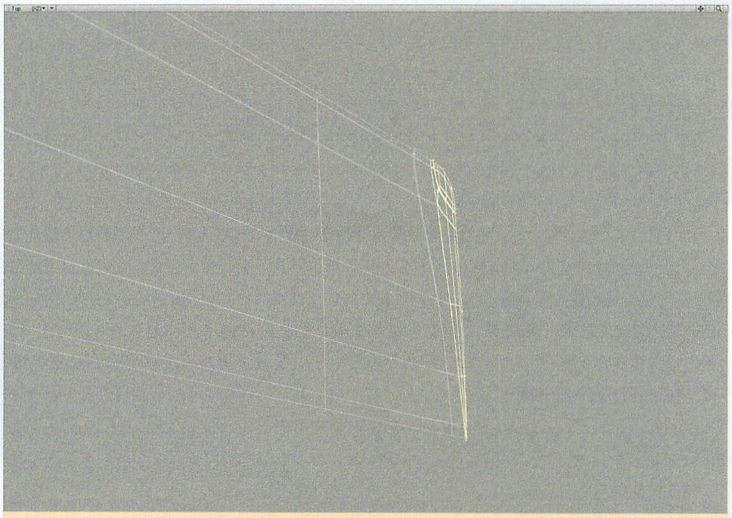
PIC 7– AIRBUS MAIN WING

MAIN WINGS

The main airplane wings are a bit tricky to un-wrap in order to create a better UV map. We are going to use the two techniques described in the first part of this tutorial series. We'll focus here in Modeler and on how to un-wrap the main wing to create a completely flat and paint-friendly UV map. Go to layer 3. Here we find the main aircraft's wing (Pic7). We want to paint a seamless texture on both sides of the wing, so we have to un-wrap the under-side in such a way that its polygon normals face the same direction as the polygons of the top-side of the wing.



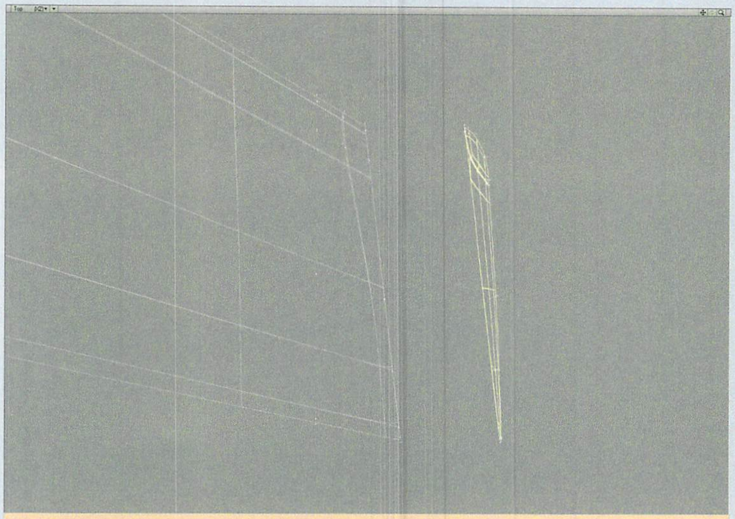
PIC 8– SELECT THE WING TIP POLYGONS



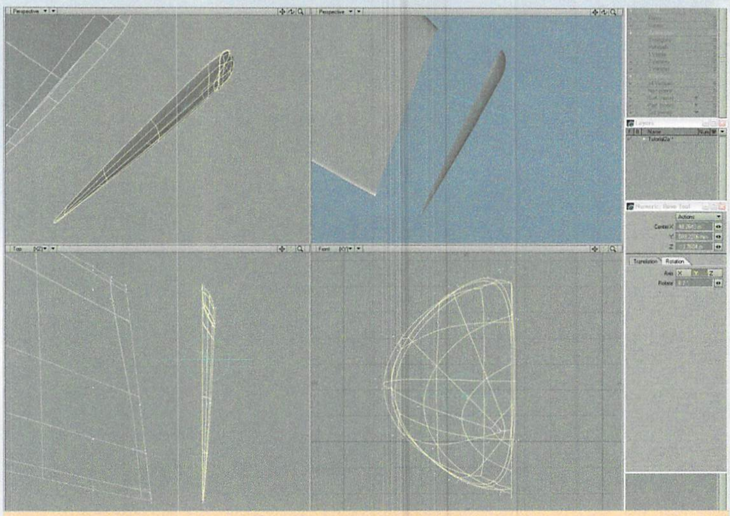
PIC 9– ONLY THE WING TIP POLYGONS SELECTED

How're we going to do that? Well, it's not easy, so follow along carefully. First of all, let's separate the main wing from its wing tip. In a Top view window, zoom to the wing tip and select the polygons as shown in Pic8. Then, hit "Shift + [" twice to leave only the wing tip polygons selected (Pic9). Hit the "x" (cut) and immediately "v" (paste) to separate them from the wing.

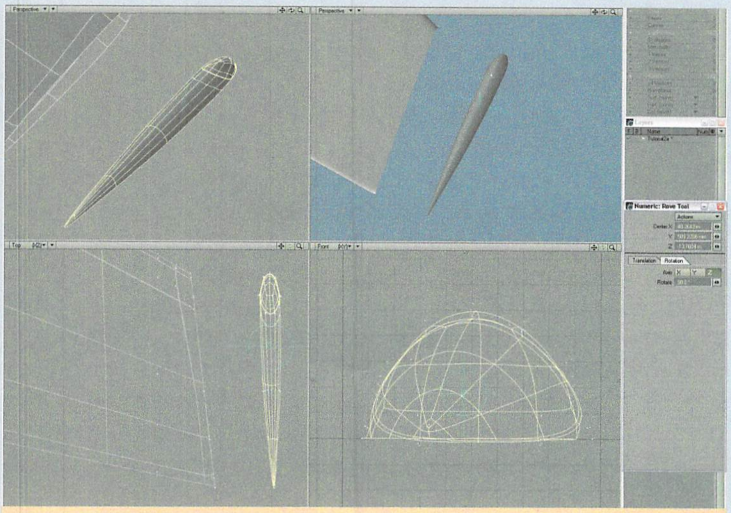
Click and select the "Airbus_M" morph map. Select the separated wing tip polygons and move them to the right, away from the wing (Pic10). Select the Rove tool, which is under the Modify tab, and hit "n" to set the rove axis at the center of the selected wing tip polygons and open the numeric panel. At the numeric panel, click on the rotate tab



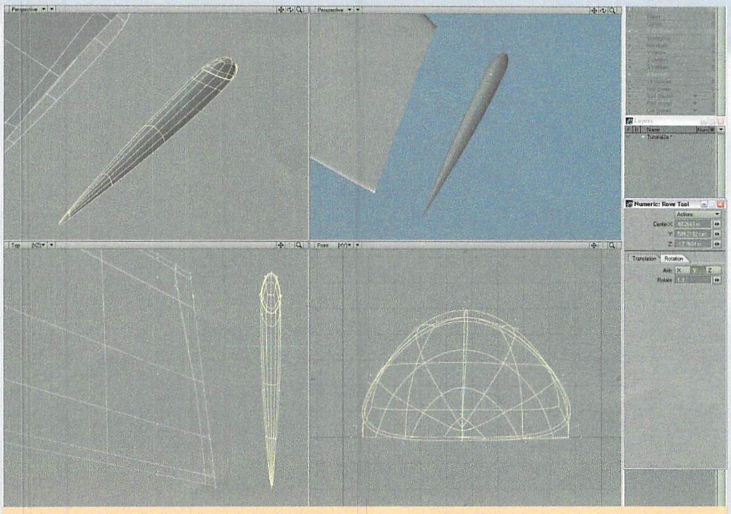
***PIC 10*–** SEPARATE THE WING TIP POLYGONS FROM THE MAIN WING



***PIC 11*–** BASE LINE OF POINTS PARALLEL TO Y-WORLD AXIS



***PIC 12*–** DROP THE ROVE TOOL



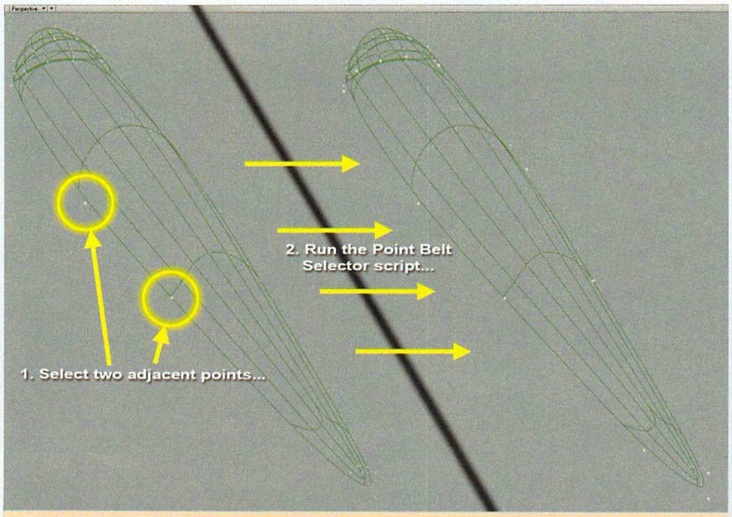
***PIC 13*–** COMPLETED ALIGNMENT OF THE WING TIP

and rotate the wing tip “6.7” degrees on the Y-axis to make the base line of points parallel to the Y-world axis (Pic11).

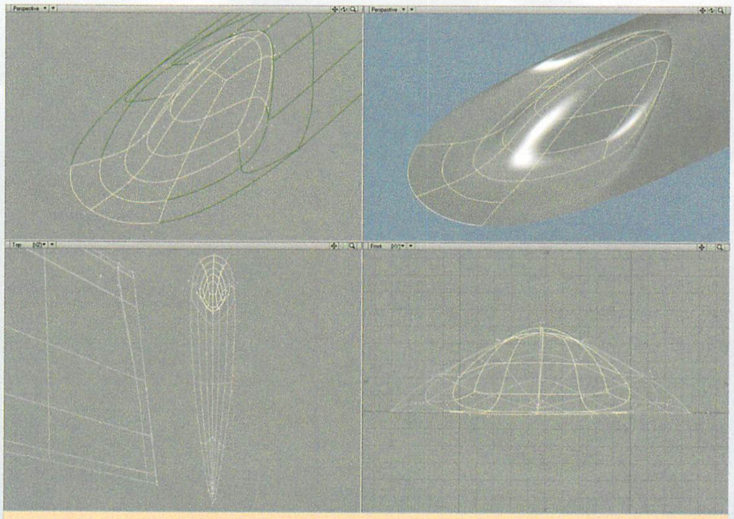
Hit the spacebar to drop the Rove tool and then select it once more. This time we are going to rotate the wing tip on the Z-axis. Hit “n” to place the rove axis at the center of the wing tip, and at the rotate tab in the text input area for the Z-axis, enter “90” degrees and hit Enter. Hit the spacebar to drop the rove tool (Pic12) and select it again one last time and follow the same procedure to rotate the wing tip “1.3” degrees on the Y-axis to complete the alignment (Pic13). We did the rotations in three separate steps, not in a single one, because it’s much easier to align one axis at a time than “fighting” with the rotation controls to align them all at once.

Remember! We are still working for the “Airbus_M” morph map and not for the “base” object.

Select two adjacent points of the wing tip's base and run the "Point Belt Selector" script to select all the base row points (Pic14). Hit "Shift +]" two times to add two additional point rows to the selection. Hit "h" (stretch tool) and, working in a Top view window, stretch the selected points on the X-axis about 130%. Make sure you have "Selection" for pivot mode and do the stretch with the mouse on the Top view, not with the numeric panel. Then, do another stretch of about 105%, this time on the Z-axis. Hit "Shift + [" once, to remove one point row from the selection, and do another stretch in Top view, with the same settings as before. One more time, hit "Shift + [" once, to remove another point row from the selection and stretch the last point row in Top view, with the same settings as before. Deselect all points and select the polygons as shown in Pic15 and 16.

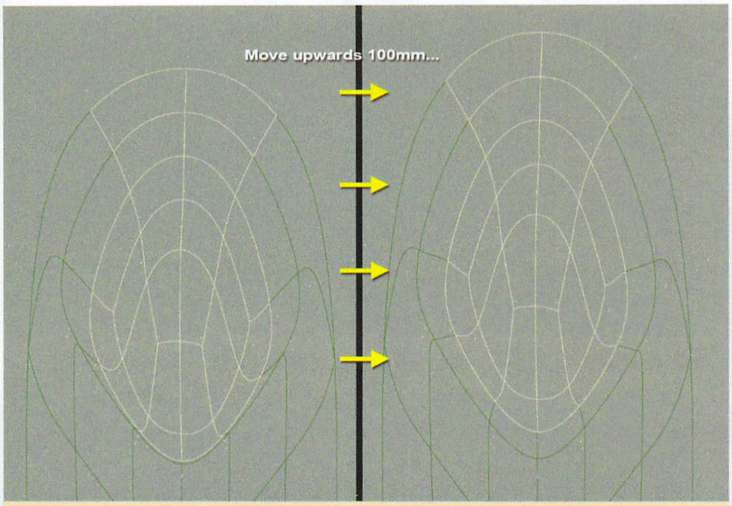

1. Select two adjacent points...
2. Run the Point Belt Selector script...

PIC 14– SELECT ALL BASE ROW POINTS

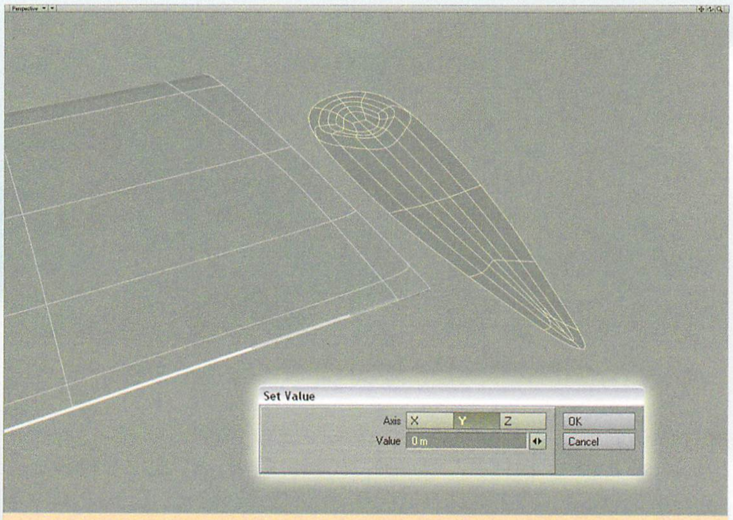


PIC 15– SPECIFIC POLYGON SELECTION

Move them upwards 100mm (on X) in a Top view, just enough to clear all polygons from possible overlapping (Pic16). Then select all the wing tip polygons and flatten them on the Y-axis at 0 m, like in Pic17, and then press "-" to hide them.



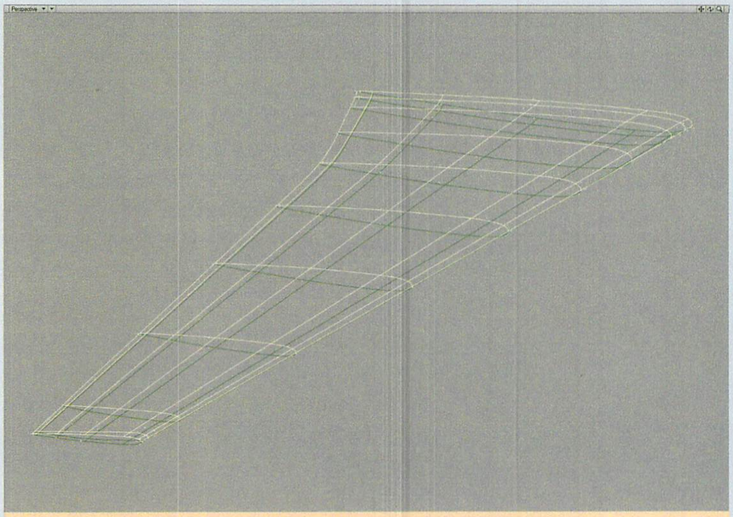
PIC 16– KEEP ALL POLYGONS FROM OVERLAPPING



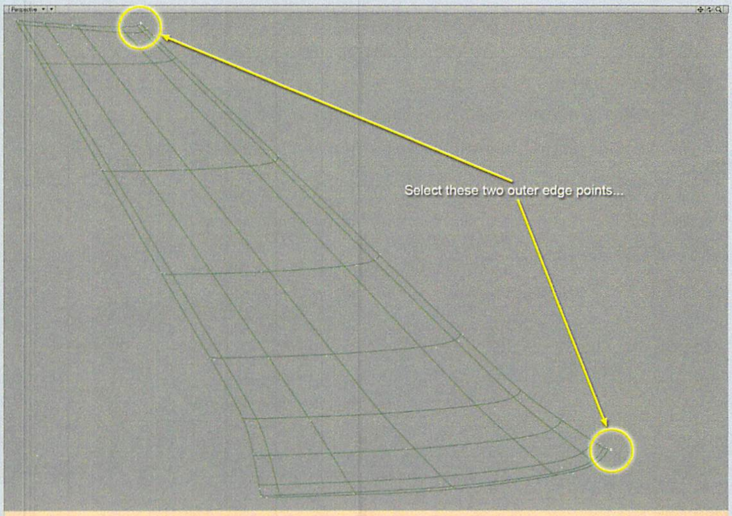
Value 0 m

PIC 17– FLATTENED WING TIP POLYGONS

In Polygon Selection mode, select the upper side polygons of the wing, like in Pic18. We are going to make selection sets for the upper and under sides for easier and faster manipulation. The wing already had a Dark Green color. Under the Detail tab, click on the Sketch Color and change the selected polygon's color to a Dark Red. Now we have two different colors for the top and bottom wing sides. Cut and immediately paste back the selected polygons. Select the front edge polygons of both the top and bottom sides, like in Pic19, and press "m" to merge the points belonging to those polygons.

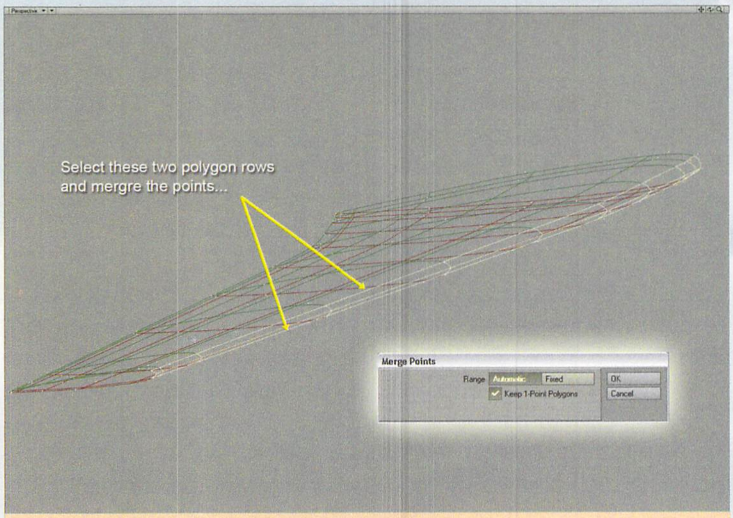


PIC 18– THE UPPER SIDE POLYGONS OF THE MAIN WING



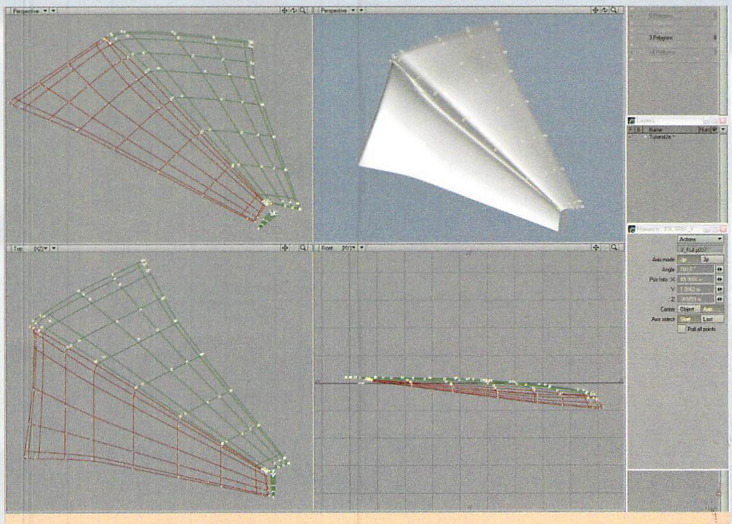
Select these two outer edge points...

PIC 20– SELECT THE OUTERMOST POINTS OF THE WING



Select these two polygon rows and mergre the points...

PIC 19– THE FRONT EDGE POLYGONS



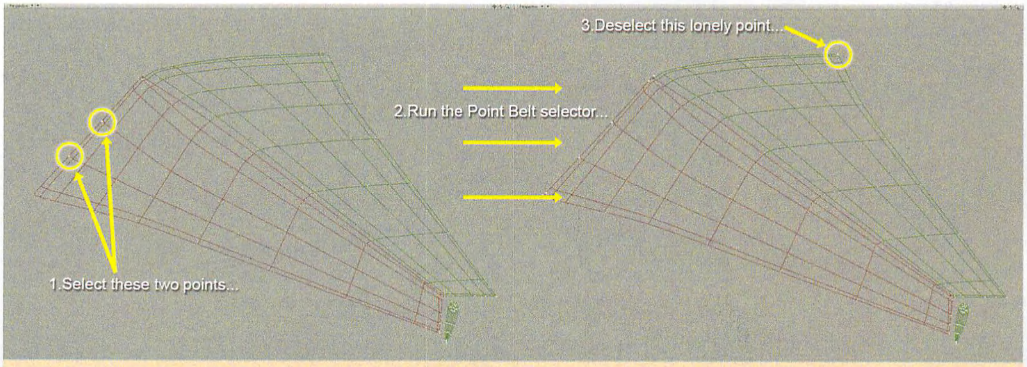
PIC 21– THE WING SHOULD LOOK LIKE THIS

Now, deselect all polygons, and in the Polygon Statistics panel, select the Dark Green for Color selection and click on the + symbol next to it. Press "=" to hide all but selected. Change to Point Selection mode and select the two outer points of the front edge of the wing, as shown in Pic20.

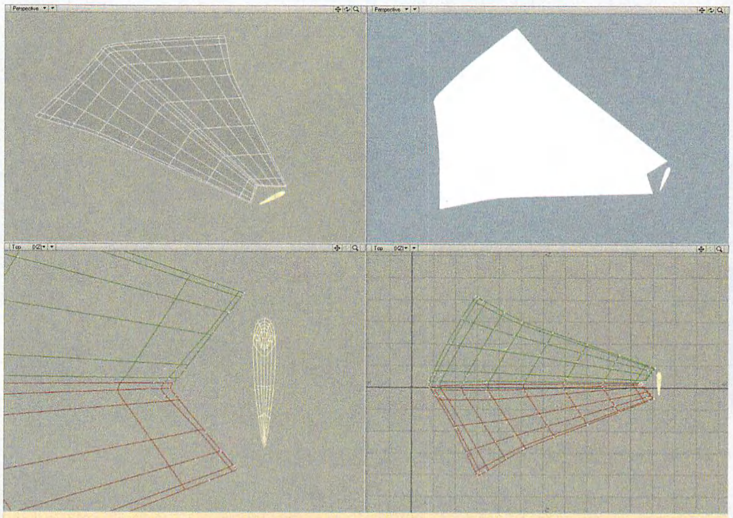
Having these two points selected, press "]" to select all connected points and then "\" to unhide everything. You should end up with all the under wing's points selected, but not the wing's tip, nor the top wing side. The first two selected points orient an axis, which we'll use for the "V Roll" plug-in. Run the plug-in and press "n" to bring up the Numeric panel. Set the following settings. "Axis mode" should be set to "2p," "Center" should be set to "Axis," and "Axis select" should be set to "Start." Other settings should be left at the default state. At the "Angle" text input area, enter 180 and press Enter. You should see something like in Pic21.

Press "t" to move the selected points and press "n" to go to the Numeric panel. On the X text input area, type "250 mm," click on Apply and press Return. Press "Shift + [" once to deselect the first point row, and in the Numeric panel at the X text input area, type "150 mm," click on Apply, and press Return. Again, press "Shift + [" once, to deselect one more point row, and in the Numeric panel at the X text input area type "100 mm," click on Apply and press Return, then Space to drop the Move tool. This

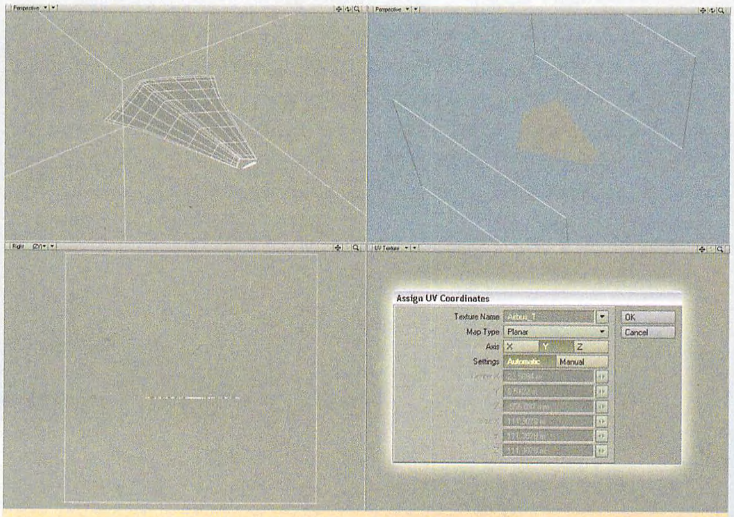
way we spread out the polygons in the middle area of the wing a bit. Now, deselect all points and select only the two points of the inner edge of the upper (Red Color) wing, as shown in Pic22, and apply the Point Belt Selector script. Deselect the lonely point of the under (Red Color) wing, (see Pic22) and press "Shift + a" to fit the selected points in all views.


3.Deselect this lonely point...
2.Run the Point Belt selector...
1.Select these two points...

PIC 22– THE SEPARATED UPPER AND LOWER WINGS



PIC 23– POSITION THE WING TIP POLYGONS AS ABOVE



Assign UV Coordinates

Texture Name: Airbus_T

Map Type: Planar

Axis: Y

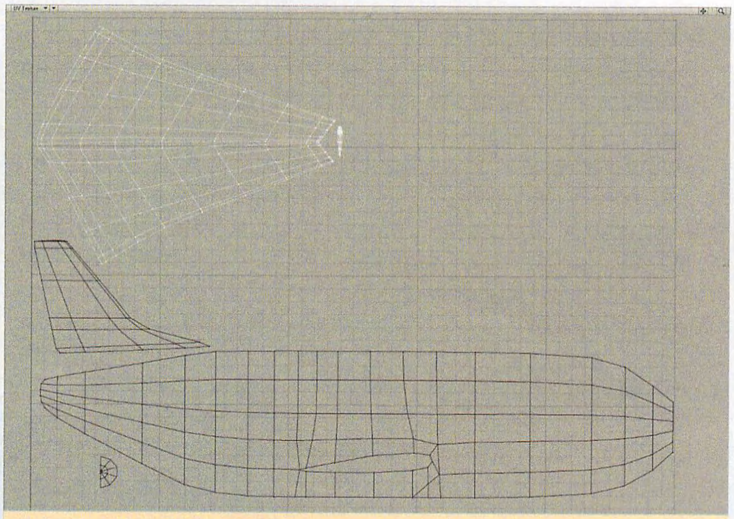
Settings: Automatic

PIC 24– THE ASSIGN UV COORDINATES WINDOW

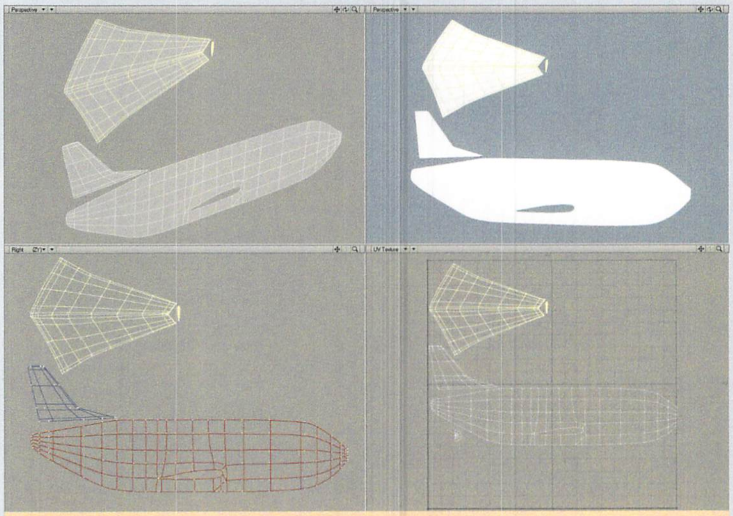
Press "t" to move the selected points leftwards on the Top view. For this, bring up the Numeric panel and in the X text input area, type "-350 mm," click on Apply and press Return. Drop the move tool, deselect all points and flatten on the Y-axis at "0 m" all points. Select all polygons except the wing tip's and rotate them 33 degrees using the mouse, with pivot mode set to "Selection." Now, select the wing tip polygons. Move them in a position like in Pic23.

We are ready to create a UV map for our wing now. Select layers 3 and 9 and at the Map tab, click on the "Make UVs" button. Make sure "Airbus_T" is the selected Texture Name. Map Type should be "Planar," Axis "Y" and Settings "Automatic" (Pic24). Click on the OK button, then press 3 to have only the wing layer foregrounded. Press "q" to assign the "Airbus" surface to the wing. You should see now the "Lines" texture applied on the wing and that it's somewhat distorted. This was expected, but again it's okay, since we'll use the "Front-Projection UVs" technique to eliminate any distortion. Next, we have to make sure that the wing's UVs are not overlapping the airbus UVs.

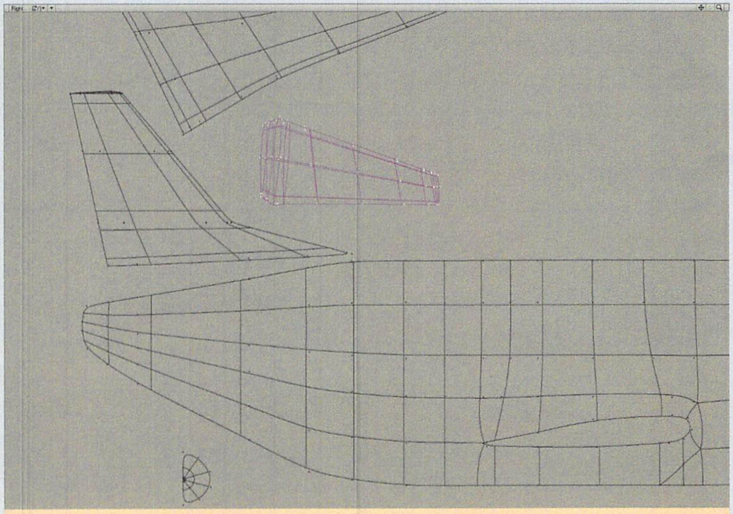
Select layer 1 as background and 3 as foreground and at the UV Texture window, move the wing polygons away, in a position, like in Pic25. Next, cut all the wing polygons and paste them in layer 1. Last thing to do is to make sure that no overlapping polygons exist in the morph map either. For this, we can click on the "Airbus_M" morph map and select all the wing polygons, including the wing tip. Then, move and rotate the selected wing polygons in all views to position and orient them, like in Pic26. Use the "e" and "r" shortcuts for rotating 90 degrees at a time. Try to resemble the look of the UV texture map. When you're done you can click on the morph map to deselect (deactivate) it.



PIC 25– WING POLYGONS SHOULD BE MOVED AWAY FROM BODY



PIC 26– POSITION WING POLYGONS AS ABOVE



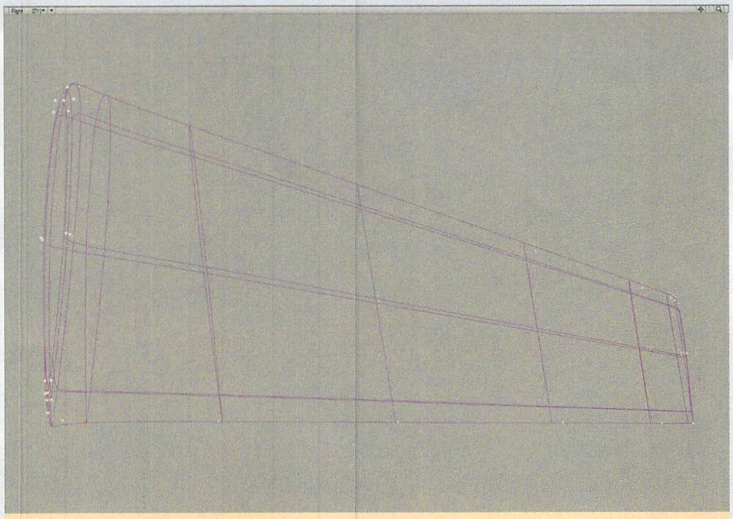
PIC 27– HORIZONTAL STABILIZERS IN PROPER POSITION

Now you can go to Layout and use the "Front-Projection UVs" technique. The setup scene we made last time will work perfectly for the updated "Airbus_M" morph map and we can bake all surfaces in one. We'll do a quick refreshment of the process when ready to export our finished UV map as a bitmap. Let's move on to layer 4 and the Horizontal Stabilizer wings.

HORIZONTAL STABILIZER WINGS

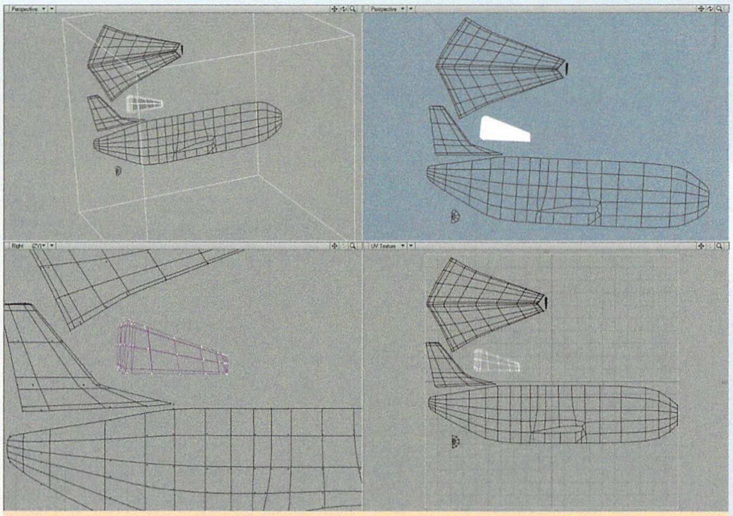
The horizontal stabilizer wing UV is fairly easy to create. Set layer 4 as foreground and 1 as background. Select the "Airbus_M" morph map by clicking on it at the Vertex Maps panel. Press the "r" and then "e" shortcut buttons accordingly, to rotate the horizontal wing until it's perpendicular to the X-axis and its edge trail is parallel to Z-axis. Then, move it in a position like in Pic27.

Hit "4" (not on the Numeric panel) to see only the fourth layer. Switch to a full screen Right view and press "a" to fit the horizontal wing on the screen. In Point Selection mode, using the Point Belt Selector script, select the edge point row from the side that is touching the fuselage and press "Shift +]" once to expand the selection, like in Pic28. Move them to the left, just

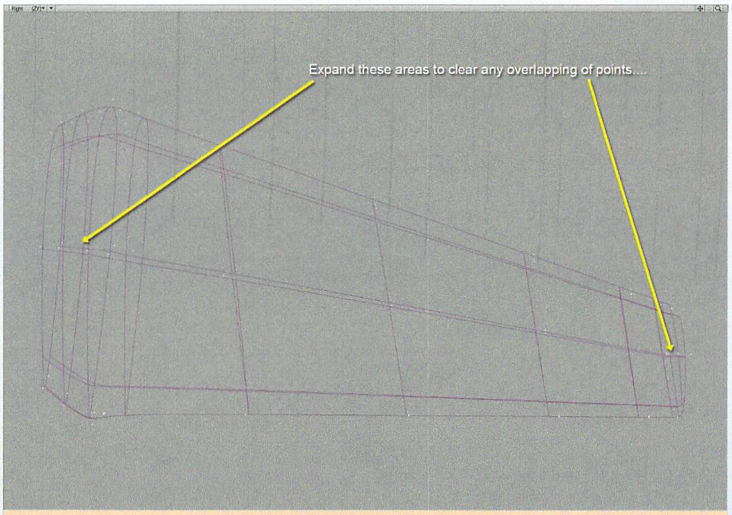


PIC 28– THE EXPANDED SELECTION

enough to clean any overlapping to those points. Press "Shift + [" to deselect the second row and move the last row a little more to the left. Do the same for the point rows at the opposite side; the ones at the outer edge of the horizontal wing (Pic29). Press "Ctrl + v" to flatten all points on the X-axis at 0 meters. Work on the four windows now (one of them should be set to UV Texture) and select layers 4 and 9 as foreground layers. Click on the "Make UVs" button and the Assign UV Coordinates panel opens. "Airbus_T" should be already selected, Map type should be "Planar," Axis should be "X" and Settings as "Automatic," then hit Enter (Pic30).



PIC 30– AFTER ASSIGNING THE UV COORDINATES



PIC 29– THE OUTER EDGE POINTS

Now, assign the "Airbus" surface to the horizontal wing, hit "4" again, cut all polygons and paste them back in layer 1. That's it! Horizontal stabilizer wing UVs are finished. Next time we'll complete the "Airbus_T" UV map and the "Airbus_M" morph map for the whole aircraft. Again, if you have any questions you can e-mail me at this address: darkjedi@otenet.gr. Stay tuned for the third part of this tutorial series and until the next issue, keep on LightWaving … ■

GREGORY GLEZAKOS (AKA "T.REX" TO HIS FRIENDS) IS AN EXPERIENCED 3D ARTIST WORKING PROFESSIONALLY FOR THE LAST 10 YEARS, EITHER AS A FREELANCER OR CONTRACTED TO MAJOR DOMESTIC PRODUCTION STUDIOS. WHEN BETWEEN JOBS, HE IS TEACHING LIGHTWAVE AND DIGITAL FUSION, EITHER TO STUDENTS OR BY HELPING ARTISTS IN VARIOUS VISUAL FX HOUSES MEET THEIR DEADLINES.

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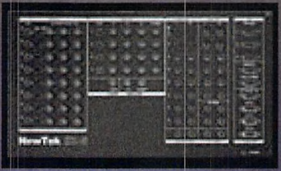

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CEL-SHADING: BLENDING TRADITION WITH THE 3RD DIMENSION

BY HUNTER WOLF

Many of us have very fond memories of the cartoons of yesteryear. Whether it was Mighty Mouse, Popeye, Underdog or even the perpetual Looney Tunes, all of us grew up with 2D animation. Even stuff that wasn't in 2D, like the stop-motion magic of the Sinbad movies or the ultra-hipness of Anderson's Thunderbirds (changed my life), ignited those tiny embers that started us on the path to the modelers and animators we've become today.

Today's various styles of animation range from remakes of old classics, the groovy stuff on the Cartoon Network, to the use of Macromedia's Flash. One style of animation, Japanese anime (though in Japan, all animation, even Disney, is called anime), seems to appeal to a huge audience of fans. That's why more 3D applications are giving animators what they want – the option to render their 3D artwork in a faux 2D anime style, called cel-shading.

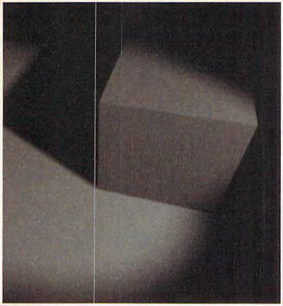
This tutorial is going to show you a very general way to apply a LightWave plug-in (which is included with your copy of LightWave, so you can put your wallet away) called BESM, which literally means Big Eyes Small Mouth. Anyone who's seen anime knows how big the eyes are on anime characters and critters. For more technical information on the plug-in, be sure to visit your LightWave manual.

WHERE DID THE TERM 'CEL' COME FROM?

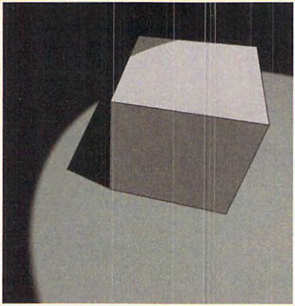
Back in the days of "Steam Boat Willie," starring Mickey Mouse, animators would hand-ink the outlines of characters and props on sheets of clear plastic. Sometimes the sheets were made of nitrate, which was prone to yellowing and rapid decomposure. But the most common origin of the term 'cel' stems from the use of the superior cellulose acetate, which animation houses still use today.

HUNTER WOLF EXPLAINS THE ART OF CEL-SHADING FOR CREATING ANIMATIONS WITH A MORE "HAND-DRAWN" FEEL

VISUAL COMPARISON



Here we see what surface shading, without plug-ins, looks like in LightWave, with Ray Tracing applied. The lights emit simulated rays toward the object, which then bounce back. From this information, the light knows how far away it is from the object, and where the shadows should fall.



Here we see the same surface cel-shaded. Instead of focusing so much on the slight gradation in tonal value, from light to dark, producing a realistic shadow, the cel-shader instead translates light areas into one flat color zone, and dark areas into another flat color zone. So, instead of soft shadows, you have hard shadows, the same type that a human would paint on cellulose acetate. If a human tried to recreate the gradual movement of soft shadow in animation, Disney would still be working on one of their first films, "Snow White and the Seven Dwarfs."

The art was inked on the front of the sheets of acetate, with the color applied to the back. Traditional animation houses painted these by hand, as opposed to today, where the computer handles the hard labor.

Of course, the complete history is much more detailed, including work by early animator Emile Reynaud, who was the first to animate on celluloid, but this ain't a magazine from the History Channel. Get your Google on to learn more online.

PROS AND CONS OF CEL-SHADING

The benefit to cel-shading is that renders are much faster. Your computer doesn't have to worry about more than one light (in many setups), where textures should be, calculating reflections, refraction, or radiosity (how come the computer-intensive stuff always starts with an 'r'?). Cel-shading is great for fans of Japanese-style anime and for children's films.

The disadvantage is the slight stigma that cel-shading is nothing more than a gimmick. This is particularly true in the realm of video games. This issue really came to DEFCON 3 when the new Legend of Zelda game for the GameCube was first unveiled. It caused such a stir that I thought people would come to blows over the new direction into which Nintendo had decided to venture.

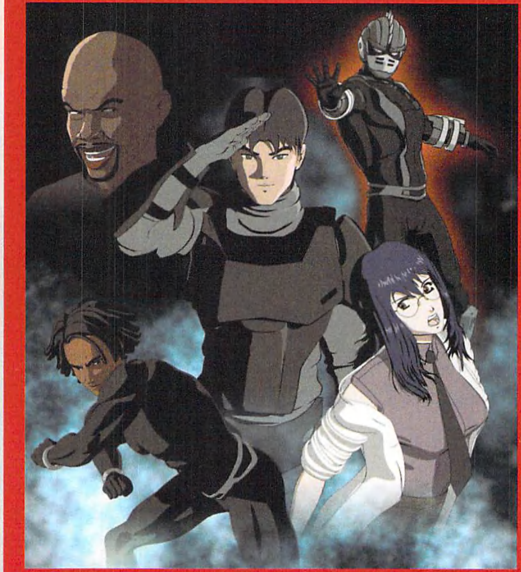
Fortunately, more people are looking at cel-shading as another form of expression.

A Chat with Terrence Walker

I had a chance to chat with Terrence Walker, of Studio ArtFX, about the techniques he employs in his films. Here's how it went down.

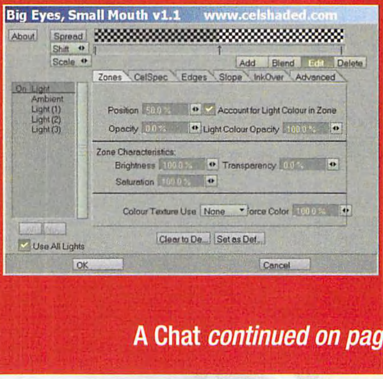
HW: *What is your lighting set-up for your cel-shading techniques?*

TW: This varies depending on the look of the show or look of the scene. Still, there are two main setups that I use. The first is the easiest, and that is using a single ray traced distant light to light a character. This gives the look most typical in anime, usually television anime. The 3/4 key light on the face. I say most typical because features like "Ghost in the Shell" clearly don't stick to any such technique and it is more of a stereotype at this point.



My other setup is to use three distant lights, all traced. A key light almost straight on the figure, and two less intense fills from the rear at approximately 3/4 angles on the figure. This seems to flatten the figure out, leaving a shadow only under the brow and chin.

HW: *What cel-shading settings do you apply to your characters in LW?*



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Position 50.0 %
☑ Account for Light Colour in Zone
Opacity 0.0 %
Light Colour Opacity 100.0 %
Zone Characteristics:
Brightness 100.0 %
Transparency 0.0 %
Saturation 100.0 %
Colour Texture Use None
Force Color 100.0 %
☑ Use All Lights

A Chat *continued on page 29*

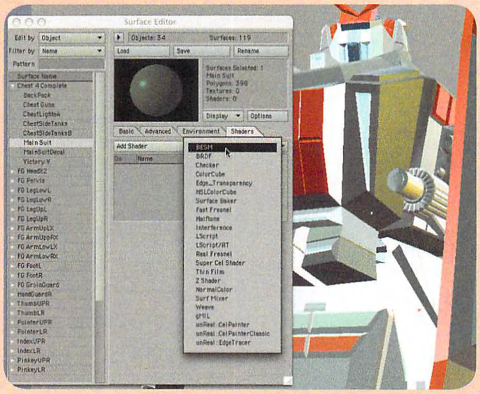
SETTING UP

You can use any model for cel-shading, but best results are obtained from simpler meshes. This image is my giant robot, or mech. His name is Fusion Gyser and he kicks major #&@. I made sure that his parts are pretty basic. I surfaced him with basic colors, using the Surface Editor, with the occasional procedural on parts of his armor. I didn't get too fancy. The settings for this render are three spot lights, with the ambient light off.

Fusion Gyser before cel-shading

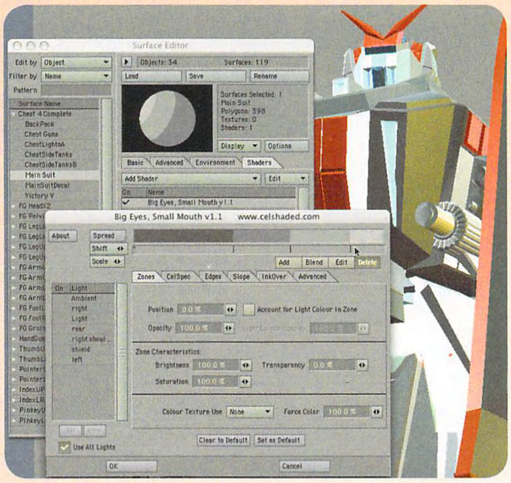
Model your object as usual. Keep in mind that the simpler the model and its parts, the better results with cel-shading. It's not etched in stone, but it is a good rule to follow.

Cel-shading works best with only one light in the scene. The effect you're going for is a main color and the shadow of that color. Open up the Surface Editor and select the object or surface name you want to apply cel-shading to. In this case, I'm selecting Fusion Gyser's main armor color. Once you've chosen the part you want to cel-shade, click on the Shaders Tab in the Surface Editor. Then choose the BESM plug-in from the Add Shader drop down list.



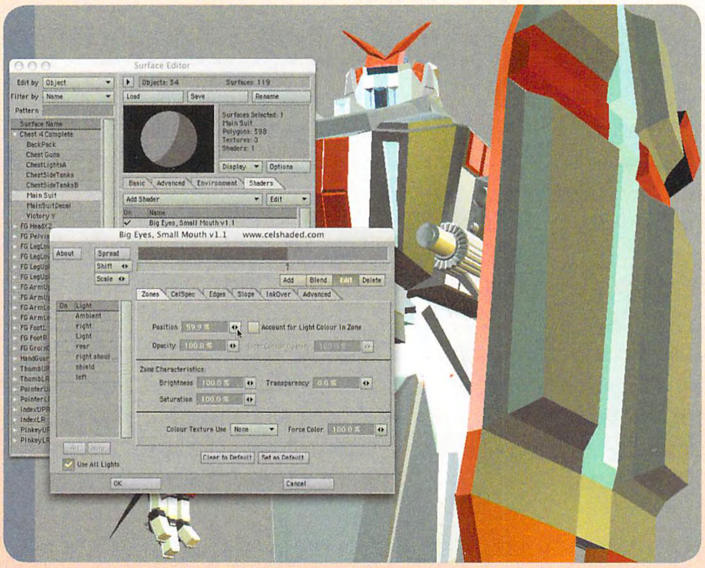
Choose BESM Plug-in from the Add Shader drop down list

The BESM panel opens and you will notice that it starts you off with the default four zone color shading for your selected surface. To get a more anime feel, I usually narrow this down to two zones. To delete zones, click the Delete button in the panel, and then click one of the thin lines (under the colors) that separate each color zone.



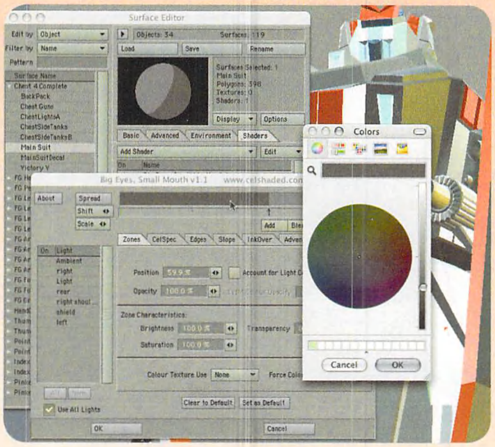
Delete zones from the BESM panel and click the thin lines separating each color zone

You can adjust how much area each color zone occupies in your surfaces by clicking the Edit button, and then using the arrows to move the position. I tend to allow the shadow areas to take more room in each surface. There is no right and wrong with any of these steps. It's just like cooking – add salt to taste, not by the recipe.



Click the Edit button to Adjust the area that each color zone occupies. This is done to your own tastes

To change the color in each zone, click once in the color bar to open the Color Picker. Select a color for the zone, click OK, then click once in the other color bar and repeat.



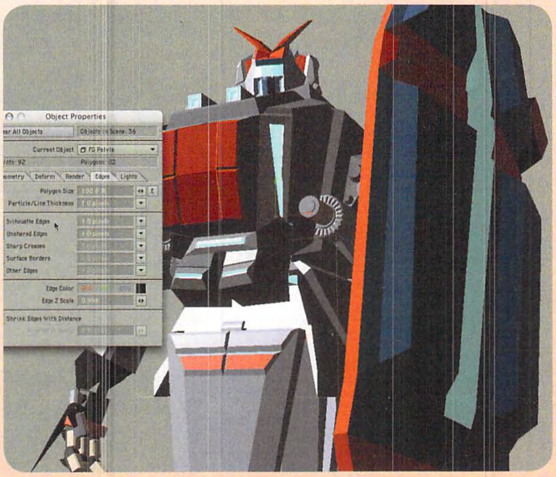
Use the Color Picker to select a color for each zone.

Now we have to give the model some outlines, so it looks more like a hand drawn cartoon. Once again, these settings take experimentation, depending on whether you are working on organic or non-organic models.

Select your object in Layout and then hit the 'p' key on the keyboard to open the Item Properties panel. Click the Edges tab and you'll find quite a few options available:

- *Silhouette Edges will place outlines on the outer contours of the selected object*
- *Unshared Edges will place lines where two different surfaces meet, but don't share the edge of a polygon.*
- *Sharp Creases will place outlines that have creases or folds*
- *Surface Borders works like Unshared Edges, but places lines where polygons meet*
- *Other Edges places lines on all polygons, except where two surfaces meet.*

You have several options under Edges in the Item Properties panel



What I normally choose for organic models, like people and animals, are both Silhouette Edges and Unshared Edges. But for Fusion Gyser, I selected everything except Other Edges, to give me as many lines as possible. When you're done applying the shader to your surfaces, render with Ray Tracing enabled.

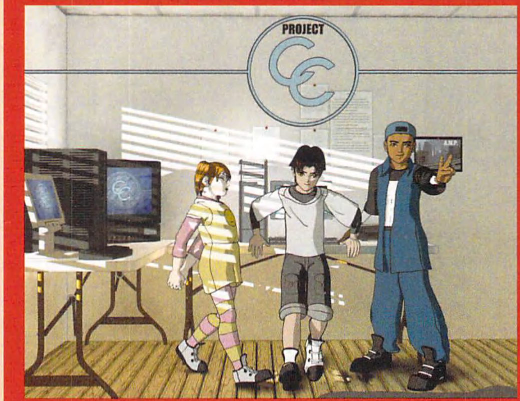
A Chat *continued from page 27*

I have used BESM (Big Eyes Small Mouth) since the Shadowskin project, chiefly because of its ability to load and save defaults. Otherwise I would still use Hanstings'

Super Cel Shader. I apply three zones to my character, though you rarely ever see this anywhere but in the cover art. The purpose of the three zones is so that I can show different lighting models on my character without having to create different versions for day and night scenes. By using a bright light and ambient lighting, I can show only zones one and two for day scenes. Using less light might show zone two and three for night. I sometimes use zone two and three for my main lighting and the first zone can be for lighting effects like a gunshot or explosion going off.

HW: *Do you apply different settings for inorganic objects such as weapons and buildings?*

TW: Generally static objects are considered "background" elements and are rendered more realistically. I try to achieve a detailed painted look for these items. Weapons carried by the characters are cel-shaded identically to the character.



Vehicles fall into a different category. I cel-shade vehicles as I want them to look drawn. I may, however, use BESM's specular features for cars, or even use some kind of simplistic two-color reflection map for extra detail on a car surface.

HW: *What have you learned in your techniques, from "Understanding Chaos" to your latest film, in regards to settings and workflow?*

TW: The greatest thing I learned from my first project to now is not to limit myself and to assume nothing. There is always more than

A Chat *continued next page*

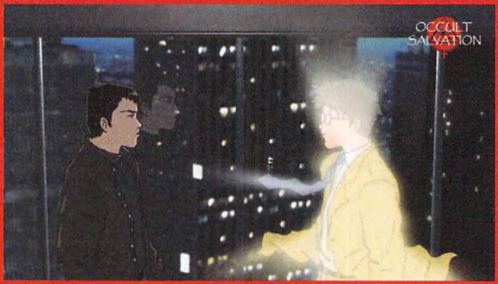
A Chat *continued from page 29*

one way to approach a particular scene and usually there is a better way than the first idea I come up with. I have learned now to think in elements, similar to how a complex VFX shot is put together in modern film. Because I use Mirage, from Bauhaus Software, as my compositor, I think with that software in mind. Everything is created for it. Because of this, I no longer limit myself to what may be thought of as a complete 3D scene. It is rarely necessary. All the elements may not even need to actually exist together.

The one thing that has not changed significantly are my characters. I did recently design a new skeleton with which to animate them, one having many more bones, controls and a more complex rig, with the important addition of fully working hands. Still, the way I do characters remains basically unchanged. I have also improved how I work with dynamics. I realized that in many ways I was saddled with old ways of doing things. My models were too simplistic for dynamics such as cloth and so I had to use them at SubD level 2 to get any results. This was usually too slow to be useful in production. The problem was not in the software, it was in my approach. It was time to update my characters. They needed to be rounded a bit more. Computers have long been fast enough to work in real-time with much more complex models than I was working with. That was the only reason I kept them simple in the first place. Now I have found a happy medium where my characters remain quick to work with in real-time, but have enough detail to be used for dynamics.

HW: *How do you manage to get such a perfectly anime look to your 3D models?*

TW: I think the key comes in visualizing an anime character in 3D. I could not do this. Luckily that work is already done for me, partially in the many Japanese 3D fighting games and also in the maquettes or figures of popular anime characters found in Japan. These show exactly how to build a 3D character, which will cel-shade perfectly to create that anime appearance.

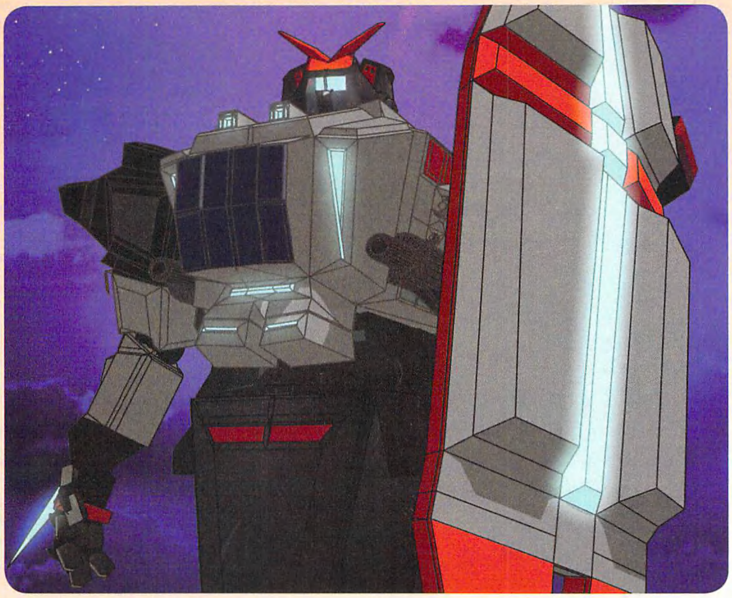


HW: *Do you use any modeling tricks to achieve a more anime look?*

TW: The only trick I have ever used is simplicity. Anime characters have to be simple. In the 2D world, someone would have to draw it over and over again.

As I begin to detail out a character, I have to ask myself if I would realistically want to draw that by hand, frame by frame. If not, then there is probably too much detail and it will never come across as drawn. KF

This image is the cel-shaded version. The settings for this render are one spot light at 100%, positioned to the front and right of the model. The ambient light is set to its default intensity of 25%. I've found that I achieve better results using the ambient light when cel-shading. I turn it off otherwise.



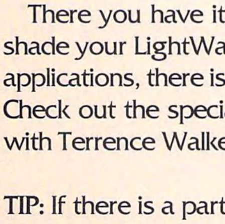
Fusion Gyser after cel-shading

There you have it, a basic look at just one possible way to cel-shade your LightWave models. But, like with many other graphics applications, there is more than one way to achieve the same goal. Check out the special side bar of this article for my conversation with Terrence Walker to see how he uses cel-shading in his work.

TIP: If there is a part of your model that you model to which you do not want to apply cel-shading, give it a different surface name in Modeler.

TIP: It's a great idea to select Save All Objects from the File menu so your shader settings are remembered the next time you launch Layout.

TIP: Once you've set one surface the way you like it, right-click (Mac users with a one mouse button should control-click...and BUY a three button mouse like I did) on the surface name in the Surface Editor to copy it. Then choose another surface that you want to cel-shade, and right-click to paste the style to it. All you have to do is return to the Shaders panel and change the colors of the zones. Working smarter is what computers are all about.

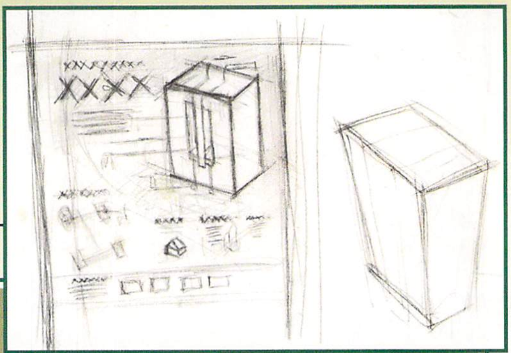


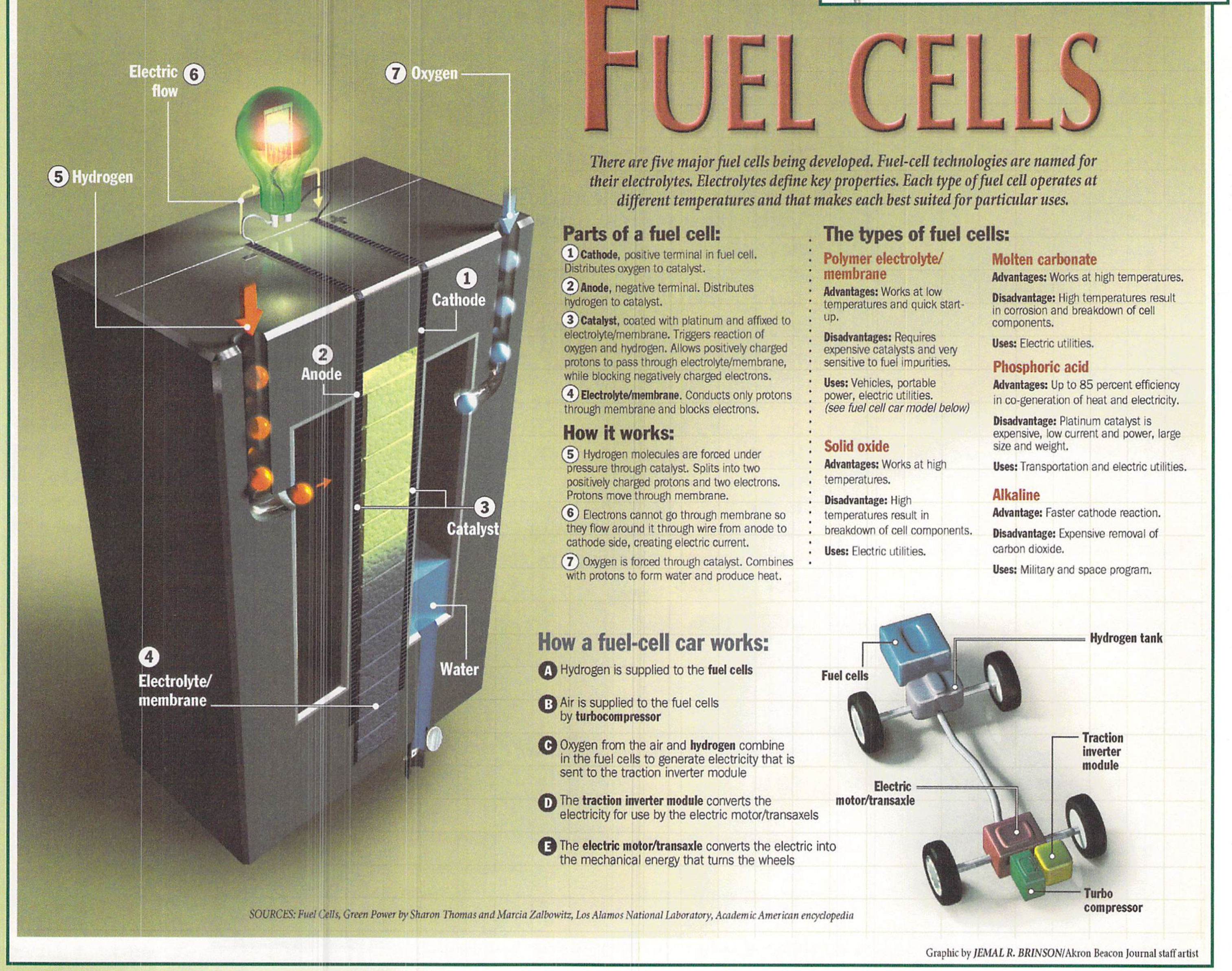
HUNTER (DWAYNE J. FERGUSON...HENCE THE NAME CHANGE) IS A TELEVISION ANIMATION ART DIRECTOR/SCRIPTWRITER ("MUTANT LEAGUE"), AND AUTHOR (NOMINATED FOR THE CORETTA SCOTT KING AWARD FOR KID CARAMEL: PRIVATE INVESTIGATOR." HE IS ALSO THE CREATOR OF THE SUCCESSFUL "HAMSTER VICE" COMIC BOOK SERIES) HE IS A COLLEGE PROFESSOR AND PROFESSIONAL AUTHOR. YOU CAN EXPERIENCE HIS MADNESS FIRSTHAND, YO, BY BOUNCING TO DIEHARDSTUDIO.COM

CREATING NEWSPAPER GRAPHICS

BY JEMAL BRINSON

Initial Rough Sketch ☛





FUEL CELLS

There are five major fuel cells being developed. Fuel-cell technologies are named for their electrolytes. Electrolytes define key properties. Each type of fuel cell operates at different temperatures and that makes each best suited for particular uses.

Parts of a fuel cell:

① **Cathode**, positive terminal in fuel cell. Distributes oxygen to catalyst.

② **Anode**, negative terminal. Distributes hydrogen to catalyst.

③ **Catalyst**, coated with platinum and affixed to electrolyte/membrane. Triggers reaction of oxygen and hydrogen. Allows positively charged protons to pass through electrolyte/membrane, while blocking negatively charged electrons.

④ **Electrolyte/membrane**. Conducts only protons through membrane and blocks electrons.

How it works:

⑤ Hydrogen molecules are forced under pressure through catalyst. Splits into two positively charged protons and two electrons. Protons move through membrane.

⑥ Electrons cannot go through membrane so they flow around it through wire from anode to cathode side, creating electric current.

⑦ Oxygen is forced through catalyst. Combines with protons to form water and produce heat.

The types of fuel cells:

Polymer electrolyte/ membrane

Advantages: Works at low temperatures and quick start-up.

Disadvantages: Requires expensive catalysts and very sensitive to fuel impurities.

Uses: Vehicles, portable power, electric utilities. *(see fuel cell car model below)*

Solid oxide

Advantages: Works at high temperatures.

Disadvantage: High temperatures result in breakdown of cell components.

Uses: Electric utilities.

Molten carbonate

Advantages: Works at high temperatures.

Disadvantage: High temperatures result in corrosion and breakdown of cell components.

Uses: Electric utilities.

Phosphoric acid

Advantages: Up to 85 percent efficiency in co-generation of heat and electricity.

Disadvantage: Platinum catalyst is expensive, low current and power, large size and weight.

Uses: Transportation and electric utilities.

Alkaline

Advantage: Faster cathode reaction.

Disadvantage: Expensive removal of carbon dioxide.

Uses: Military and space program.

How a fuel-cell car works:

Ⓐ Hydrogen is supplied to the **fuel cells**

Ⓑ Air is supplied to the fuel cells by **turbocompressor**

Ⓒ Oxygen from the air and **hydrogen** combine in the fuel cells to generate electricity that is sent to the traction inverter module

Ⓓ The **traction inverter module** converts the electricity for use by the electric motor/transaxels

Ⓔ The **electric motor/transaxle** converts the electric into the mechanical energy that turns the wheels

SOURCES: Fuel Cells, Green Power by Sharon Thomas and Marcia Zalbowitz, Los Alamos National Laboratory, Academic American encyclopedia

Graphic by *JEMAL R. BRINSON*/Akron Beacon Journal staff artist

In this tutorial, I will focus on how I put a Fuel Cell Information graphic together for my newspaper. I will quickly touch on modeling and rendering and finish up on how the layout and compositing of the rendered images in Photoshop makes it all happen.

After editors and reporters decided what article they wanted to write, I was brought in to make their idea happen visually. After I received the information from the reporter, I came up with a sketch.

Now let's start modeling. The objects are very simple. I started with a box, and I used the knife tool to create a few segments and used the bevel tool to create the gas chambers (fig 2) in the fuel cell. I used the boolean subtract feature to cut the curved holes (fig 3) in the box.

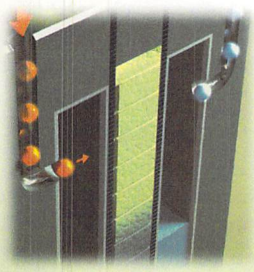


FIG 2

The gradient yellow and blue membrane in the middle of the fuel cell was created using the box tool and then a few cuts were made using the knife tool. I then used the bevel tool to raise the squared sections. I created a planar map in Photoshop to give me the gradient color for the membrane.

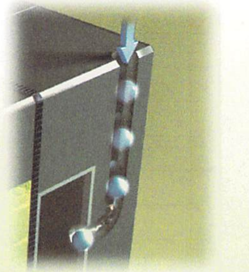


FIG 3

FIG 5

(One quick note about the orange and blue arrows in the graphic (fig 5): I used a transparency map to fade the edges. It's just a black and white gradient planar image map applied in the transparency channel. A beveled disc for the lightbulb and a few ball objects and that about does it.)

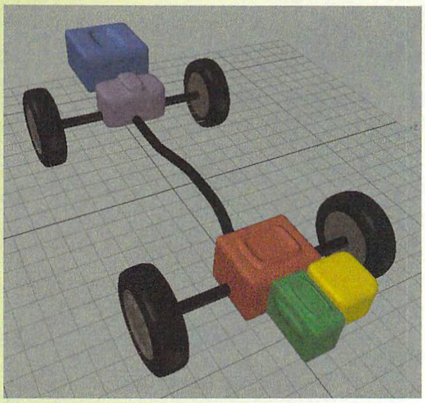


FIG 6

The car object (fig 6) is also very simple — five subpatched boxes with bevels on the tops and a couple of bevels on the sides. The goal of the car was to show how the fuel cell power flows, so I didn't need to be specific about their shapes. I created a few extruded discs to make the suspension and finally added the tires. I added a floor layer to the car object because that will be used to give the car some nice shadows.

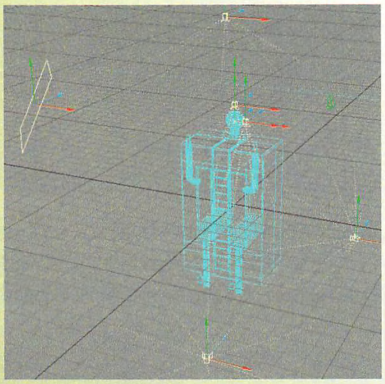
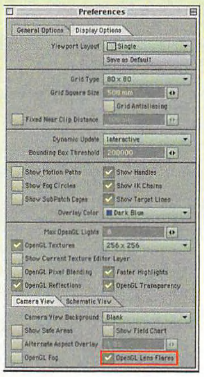


FIG 7

Now let's jump into Layout. I created two scenes to do my renderings. I have a "fuel cells" scene and a "car" scene. The fuel cells scene (fig 7) consists of seven lights. The main light is an area light to give me the soft shadows. Five of the remaining lights are spotlights, and I have one point light with a linear falloff and a lens flare to simulate the light bulb being turned on. One quick note about lens flares...you need to look through the camera view to see them in Layout. This way you can get an idea of how big the flare will be without rendering over and over again. Make sure you have "opengl lens flares" selected in the display options panel. (fig 8) To add more visual interest to the fuel cells scene I used a 20 mm wide-angle lens focal length. This way when I render the scene, the fuel cell will look distorted. (fig 9)



Preferences

General Options
Display Options

Viewport Layout: Single

Save as Default

Grid Type: 80 x 80
Grid Square Size: 500 mm
☐ Grid Antialiasing
☐ Fixed Near Clip Distance
Dynamic Update: Interactive
Bounding Box Threshold: 200000
☐ Show Motion Paths ☑ Show Handles
☐ Show Fog Circles ☑ Show IK Chains
☐ Show SubPatch Cages ☑ Show Target Lines
Overlay Color: Dark Blue
Max OpenGL Lights: 8
☑ OpenGL Textures: 256 x 256
☐ Show Current Texture Editor Layer
☐ OpenGL Pixel Blending ☑ Faster Highlights
☑ OpenGL Reflections ☑ OpenGL Transparency

Camera View
Schematic View

Camera View Background: Blank
☐ Show Safe Areas ☐ Show Field Chart
☐ Alternate Aspect Overlay
☐ OpenGL Fog ☑ OpenGL Lens Flares

FIG 8

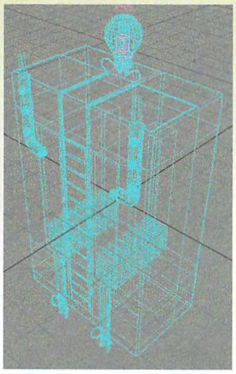
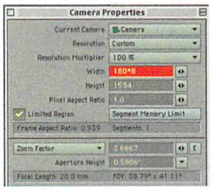


FIG 9



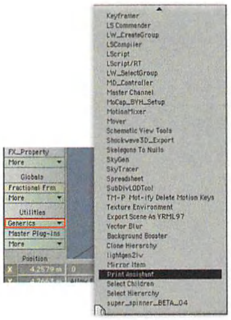
Camera Properties

Current Camera: Camera
Resolution: Custom
Resolution Multiplier: 100 %
Width: 180*8
Height: 1534
Pixel Aspect Ratio: 1.0
☑ Limited Region

Segment Memory Limit

Frame Aspect Ratio: 0.939
Segments: 1
Zoom Factor: 2.6667
Aperture Height: 0.5906"
Focal Length: 20.0 mm
FOV: 38.79° x 41.11°

FIG 10



FX_Property
More
Globals
Fractional Frm
More
Utilities
Generics
Master Plug-Ins
More
Position
X
Keyframer
LS Commander
LW_CreateGroup
LSCompiler
LScript
LScript/RT
LW_SelectGroup
MD_Controller
Master Channel
MoCap_BVH_Setup
MotionMixer
Mover
Schematic View Tools
Shockwave3D_Export
Skelegons To Nulls
SkyGen
SkyTracer
Spreadsheet
SubDivLODTool
TM-P Mot-ify Delete Motion Keys
Texture Environment
Export Scene As VRML97
Vector Blur
Background Booster
Clone Hierarchy
lightgen2lw
Mirror Item
Print Assistant
Select Children
Select Hierarchy
super_spinner_BETA_04

FIG 10A

When making the plans for the graphic I knew I would want the final graphic size to be six columns wide, which is 12 inches for my newspaper. I wanted my fuel cell image to be at least eight inches wide. Instead of guessing what dimensions to put in the width field of the camera properties (fig 10), I let LightWave do the math for me. My newspaper prints at 180 dpi and I wanted my image to be eight inches wide, so in the width field of the camera properties I typed in 180*8, hit return and got 1440. That is my resolution. I like to render my images larger than I will need them because it's always better to size images down in Photoshop instead of trying to make them larger, since Photoshop is pixel oriented. You can also use a great lscript written by Joe Zeff called the Print Assistant. You can find it in the scene tab under the utilities/generic list. (fig.10a) If it is not there you will have to load it from your lscripts folder.

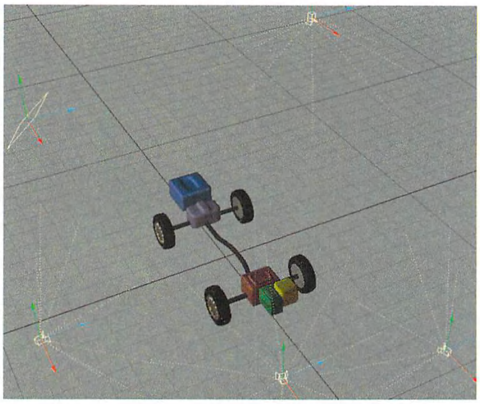
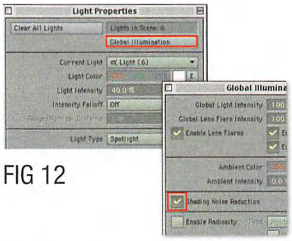


FIG 11

The car scene (fig.11) uses six lights. The main light is an area light to give nice soft shadows. The remaining fill lights are spotlights. Again, I typed in the appropriate resolution figures to give me a nice large image to work with.



Light Properties

Clear All Lights
Global Illumination

Lights in Scene: 6
Current Light: Light (6)
Light Intensity: 40.0 %
Intensity Falloff: Off
Light Type: Spotlight

Global Illumina

Global Light Intensity: 100
Global Lens Flare Intensity: 100
☑ Enable Lens Flares
Ambient Intensity: 0.0
☑ Shading Noise Reduction
☐ Enable Radiosity

FIG 12

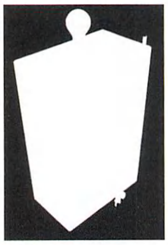
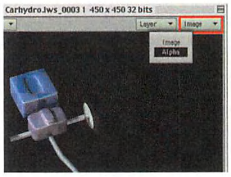


FIG 13



Carhydro.lws_0003 1 450 x 450 32 bits

Layer
Image
Image
Alpha

FIG 13A

Now let's render the scenes. The fuel cell render was pretty straightforward. I used enhanced low antialiasing and turned on "shading noise reduction" in the Lights panel/global illumination panel. (fig 12) After the render is complete and you are given the choice as to what format you want to save your image in, I chose LW_PShop32(.psd) as my file type. This is very important because it will save you time when you move the image into Photoshop. The LW_PShop32(.psd) format not only saves your image but also an alpha channel (fig 13) of the image, which you will need when compositing in Photoshop. To see the alpha image of the render, click on the Image pulldown arrow at the top of your rendered image and select alpha option. (fig 13a)

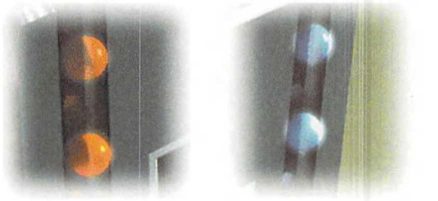
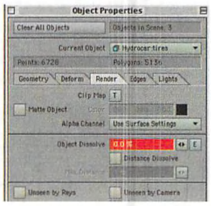


FIG 14



Object Properties
Objects in Scene: 3
Current Object: Hydrocar tires
Points: 6728
Polygons: 5136
Alpha Channel: Use Surface Settings
Object Dissolve: 0.0 %
☐ Unseen by Rays
☐ Unseen by Camera

FIG 15

Another important part of the fuel cell render is the red and orange balls (fig 14). I wanted some of the balls to be transparent, and there were a couple of options that came to mind. I could have made several different surfaces for the balls with varying degrees of transparency for each surface, but the problem there is that if I wanted to change the color of the orange or the blue balls, I would have to change each individual surface setting. Instead, I used a feature called Object Dissolve in the objects properties panel. Since the balls are separate objects, I can vary the object dissolve or transparency of each object without affecting the object's surface. Simply go to the object properties panel under the render tab and type in a number in the object dissolve percentage area and render. (fig 15)

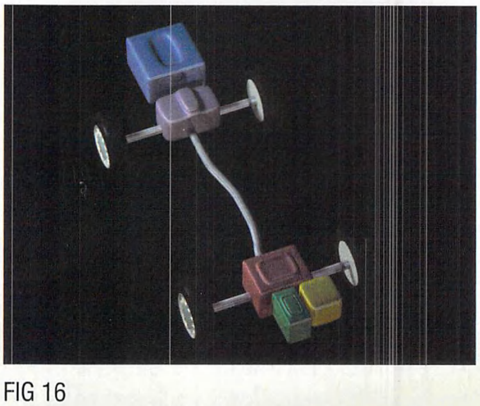
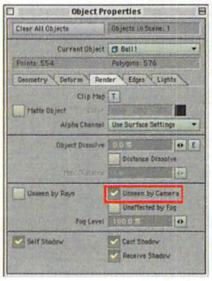


FIG 16

Next we render the car scene. This scene was rendered twice, because when working for print, you want to keep as many pieces of your final graphic as separate as possible. This makes moving objects around much easier. The first render was rendered without the floor layer under the car. (fig 16) To render without a particular layer being seen, go to the object properties panel and then the render tab. Make sure the correct layer that you don't want to render is chosen. You will see an option that says unseen by camera; (fig 16a) check it and close the panel. This will allow the car to receive the reflections, etc., from the floor without the floor being seen. I saved this file in the LW_PShop32(.psd) format as well. This also allows me to get a clean alpha channel image (fig 16b) of the car. The second render of the car scene is just the opposite. I rendered the floor and not any of the car parts. Again, in the object properties panel I selected all of the car parts and checked the unseen by camera option for them. This way I get a nice clean image of the shadow (fig 17) for the car that I can edit separately.



Object Properties
Objects in Scene: 1
Current Object: Ball1
Points: 554
Polygons: 576
Alpha Channel: Use Surface Settings
Object Dissolve: 0.0 %
☐ Unseen by Rays
☑ Unseen by Camera
☐ Unaffected by Fog
Fog Level: 100.0 %
☑ Self Shadow
☑ Cast Shadow
☑ Receive Shadow

FIG 16A

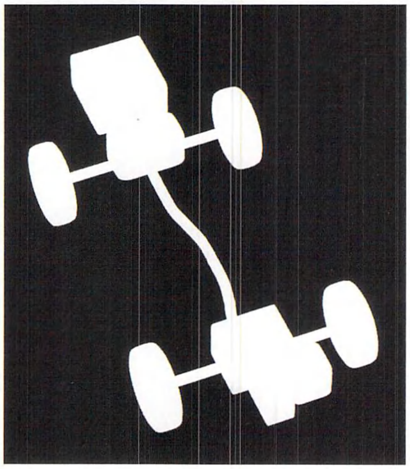


FIG 16B

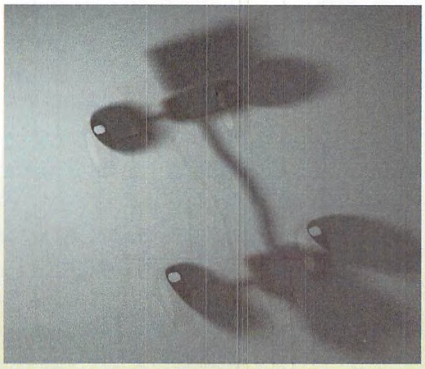


FIG 17

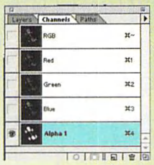


FIG 17A

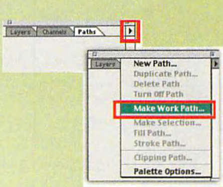
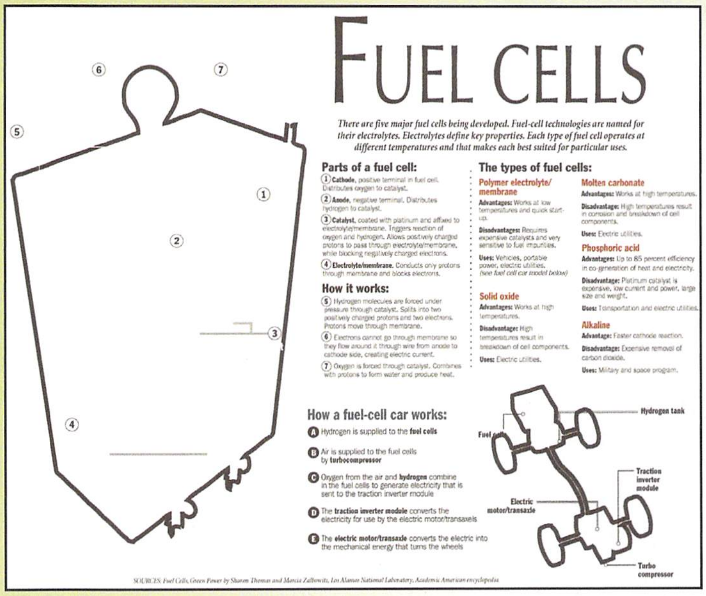


FIG 18

Now let's put all of the pieces together using Adobe Illustrator and Adobe Photoshop. Once I have a headline and all of my type for the graphic, I begin pulling all of the pieces into Adobe Illustrator. I still have a lot of work to do in Photoshop, but I need the shapes of the fuel cell and the car to gauge where the type should fall. I can use the alpha channels from the renders to give me the shapes I need. In Photoshop, I open the car render and I go to the channels tab (fig. 17a); it's next to the layers tab. Once there you will see five channels: rgb, red, green, blue and alpha. The alpha channel is what we want for now. Apple click (PC Ctrl click then Ctrl + Shift + I) on the alpha channel layer and you will see the marching ants appear, indicating a selection has been made. Then click on the paths tab, which is next to the channels tab. There is a little triangle next to the paths tab (fig 18) which, when you click on it, gives you options for your path. Pull down to the "make workpath" option and click OK when the tolerance dialog box comes up. What you have done is made a path that you can copy and paste into Illustrator to use for the shape of your artwork.

I like to use the shapes of my artwork because it saves on memory and redraw time when you are laying out your type, etc. I could have placed the final renders in Illustrator, but all we need is the shape for now. You can see why the alpha channel is important to have. We will also use the alpha channel to make a dropout or cut-out of the artwork too, when we composite all of the renders in Photoshop.

Back to Photoshop, because we have to copy the path for use in Illustrator. Select your solid arrow tool in Photoshop and click on the new path you have just made. Copy the path and paste it into Illustrator. You can fill it or stroke it with a color as you would any other shape. We will repeat the same procedure for the fuel cell image so that we can have that shape to work with as well.


⑥
⑦
⑤
①
②
③
④
Hydrogen tank
Fuel cells
Traction inverter module
Electric motor/transaxle
Turbo compressor

FUEL CELLS

There are five major fuel cells being developed. Fuel-cell technologies are named for their electrolytes. Electrolytes define key properties. Each type of fuel cell operates at different temperatures and that makes each best suited for particular uses.

Parts of a fuel cell:

① **Cathode**, positive terminal in fuel cell. Distributes oxygen to catalyst.

② **Anode**, negative terminal. Distributes hydrogen to catalyst.

③ **Catalyst**, coated with platinum and affixed to electrolyte/membrane. Triggers reaction of oxygen and hydrogen. Allows positively charged protons to pass through electrolyte/membrane, while blocking negatively charged electrons.

④ **Electrolyte/membrane.** Conducts only protons through membrane and blocks electrons.

How it works:

⑤ Hydrogen molecules are forced under pressure through catalyst. Splits into two positively charged protons and two electrons. Protons move through membrane.

⑥ Electrons cannot go through membrane so they flow around it through wire from anode to cathode side, creating electric current.

⑦ Oxygen is forced through catalyst. Combines with protons to form water and produce heat.

The types of fuel cells:

Polymer electrolyte/ membrane

Advantages: Works at low temperatures and quick start-up.

Disadvantages: Requires expensive catalysts and very sensitive to fuel impurities.

Uses: Vehicles, portable power, electric utilities. *(see fuel cell car model below)*

Solid oxide

Advantages: Works at high temperatures.

Disadvantage: High temperatures result in breakdown of cell components.

Uses: Electric utilities.

Molten carbonate

Advantages: Works at high temperatures.

Disadvantage: High temperatures result in corrosion and breakdown of cell components.

Uses: Electric utilities.

Phosphoric acid

Advantages: Up to 85 percent efficiency in co-generation of heat and electricity.

Disadvantage: Platinum catalyst is expensive, low current and power, large size and weight.

Uses: Transportation and electric utilities.

Alkaline

Advantage: Faster cathode reaction.

Disadvantage: Expensive removal of carbon dioxide.

Uses: Military and space program.

How a fuel-cell car works:

Ⓐ Hydrogen is supplied to the **fuel cells**

Ⓑ Air is supplied to the fuel cells by **turbocompressor**

Ⓒ Oxygen from the air and **hydrogen** combine in the fuel cells to generate electricity that is sent to the traction inverter module

Ⓓ The **traction inverter module** converts the electricity for use by the electric motor/transaxels

Ⓔ The **electric motor/transaxle** converts the electric into the mechanical energy that turns the wheels

SOURCES: Fuel Cells, Green Power by Sharon Thomas and Marcia Zalbowitz, Los Alamos National Laboratory, Academic American encyclopedia

FIG 19

Now that I have my type, headline, and the shapes of my artwork, I can begin moving all of the pieces around until I am pleased with the design of the page. I know what the fuel cell and the car object colors are, so I just play around with the type color until I am pleased. This is just a template, and I can always change colors later if I choose. Once I am pleased with the design of the page, I save the file, call it "template" (fig 19) and open it in Photoshop. I make the canvas size about six inches bigger all around to give me some breathing room to work with. I have the shapes I need and the type is in good relation to the artwork, so I just need to start pulling in the final renders.

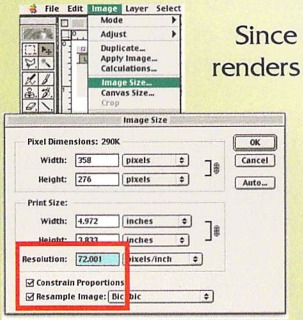


Image Size

Pixel Dimensions: 290K

Width: 358 pixels

Height: 276 pixels

Print Size:

Width: 4.972 inches

Height: 3.833 inches

Resolution: 72.001 pixels/inch

☑ Constrain Proportions

☑ Resample Image: Bicubic

FIG 20

Since all of your renders will have a resolution of 72 dpi by default, you need to convert them to your print resolution. To do this, open the render you want to change in Photoshop and click on image in the menu bar, (fig. 20) pull down to image size and select it. When it opens, click off the checkmark that says, "resample image," then type in your print resolution in the field that says resolution. Click the resample image box again and you will see your image size change because of the new number you just entered in the resolution field. If you followed the tip on calculating your image size in the camera properties panel in LightWave or if you used the Joe Zeff Print Assistant lscript, your image should be exactly the size you wanted it to be.

Let's start adding the rendered images. I open the fuel cell image and again I go to the channels tab and apple click (PC Ctrl click then Ctrl + Shift + I) on the alpha channel layer. The marching ants start again, indicating a selection has been made. This time I just do a "command + c," (PC Ctrl + c) which means copy, and copy the selection. I then go back to the Photoshop template file and paste it there. I opened the car render and repeated the same process as I did when I copied the fuel cell image.

I now have every image in place except for the car shadow image. I open the car shadow image and copy the image as is. There is no need to worry about the alpha channel here because we want to copy and paste the whole image in the Photoshop template file. This is why I rendered the car scene twice. Since I have the car image and the car shadow on separate layers, I can edit the car shadow layer without affecting the car image itself. I know I want to fade part of the car shadow layer away so it will blend in with the background, and it would be very difficult if the car parts were merged with the car's shadow. In the Photoshop template file, I created another layer to serve as a background for the entire image. (fig 21) After I played around with the color for the background, I settled on a brownish color. This is why I like to keep all of the images as separate as possible. It just makes editing different parts a breeze.

FIG 21

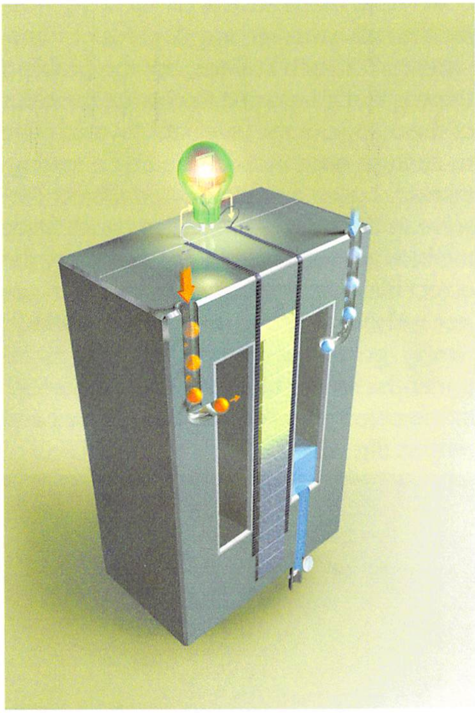


FIG 22

Now I needed to create a shadow for the fuel cell image to make it blend nicely with the background, so I selected the brown background layer and used the burn tool to darken the area behind (fig 22) the fuel cell image. It's starting to come together now. The next thing to do is fade out the shadow under the car so it blends in with the background, too. For this step I will use a layer mask.

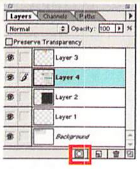

Layers
Channels
Paths
Normal
Opacity: 100 %
Preserve Transparency
Layer 3
Layer 4
Layer 2
Layer 1
Background

FIG 23

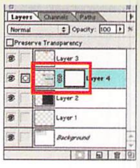

Layers
Channels
Paths
Normal
Opacity: 100 %
Preserve Transparency
Layer 3
Layer 4
Layer 2
Layer 1
Background

FIG 24

Layer masks are great because they allow you to erase an image without erasing it, if you will. To use the layer mask feature, select the layer you want to add the mask to in the layers palette and click on the add layer mask icon (fig 23). You will see a second picture box in the same layer appear. That is the mask. (fig 24) If you look at your tool bar at the foreground and the background colors, the foreground will be white and the background will be black. Click the toggle arrow for the background and foreground colors. Put black in the foreground and white in the background. Select the airbrush tool and begin painting. You will see the image start to disappear. If you toggle again, switch the foreground and background and start painting with white, the image will reappear.

Using a layer mask ensures you will always have your original image in case you need to revert back to it for any reason. So, I added a layer mask to the car shadow layer and blended it into the background. Now the fuel cell and the car are sitting nicely on the background and I just need to add a few details to really make the graphic pop, so let's do it.

One thing about using alpha channels: When you use an alpha channel to make a selection it is similar to using the pen tool or the lasso tool. The alpha channel didn't respect the fact that I used a lens flare to simulate the lightbulb being turned on, so it deleted the "halo effect" on the outside of the bulb. Not a big problem. I just added that small touch in Photoshop. I simply created a layer and got the circle tool. I made a circle a little bigger than the lightbulb and filled it with white. I then used a gaussian blur to make a halo behind the bulb. I used a Photoshop bevel filter on the fuel cells headline to give it a little pop also.

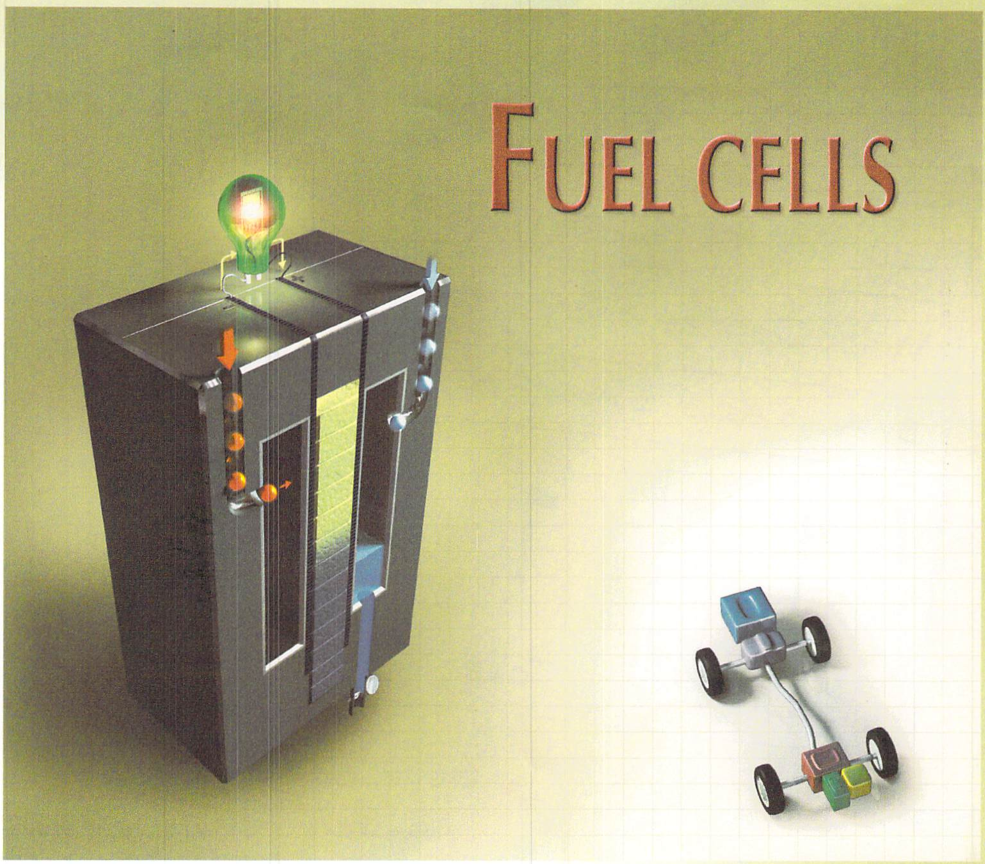
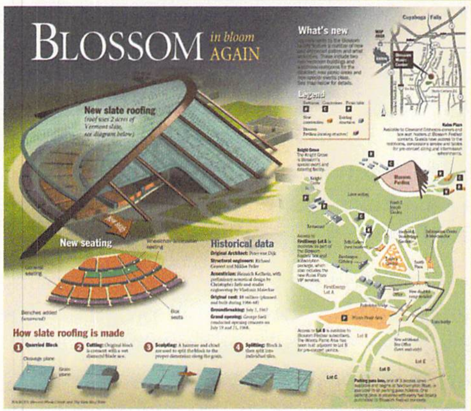


FIG 25 – THE FINAL ILLUSTRATION

The final step was adding a light grid to the background to give the image a little more interest. I could now save an eps of the final photoshop image (fig 25) and place it in Illustrator to make sure the type was to my liking. After I tweaked a little here and there, the graphic was ready for proofing and for the presses.

Well, that about does it for this project. I hope these tips will help you in your next print project. Feel free to contact me if you have any questions at rbrinson@thebeaconjournal.com.

Happy rendering! ■

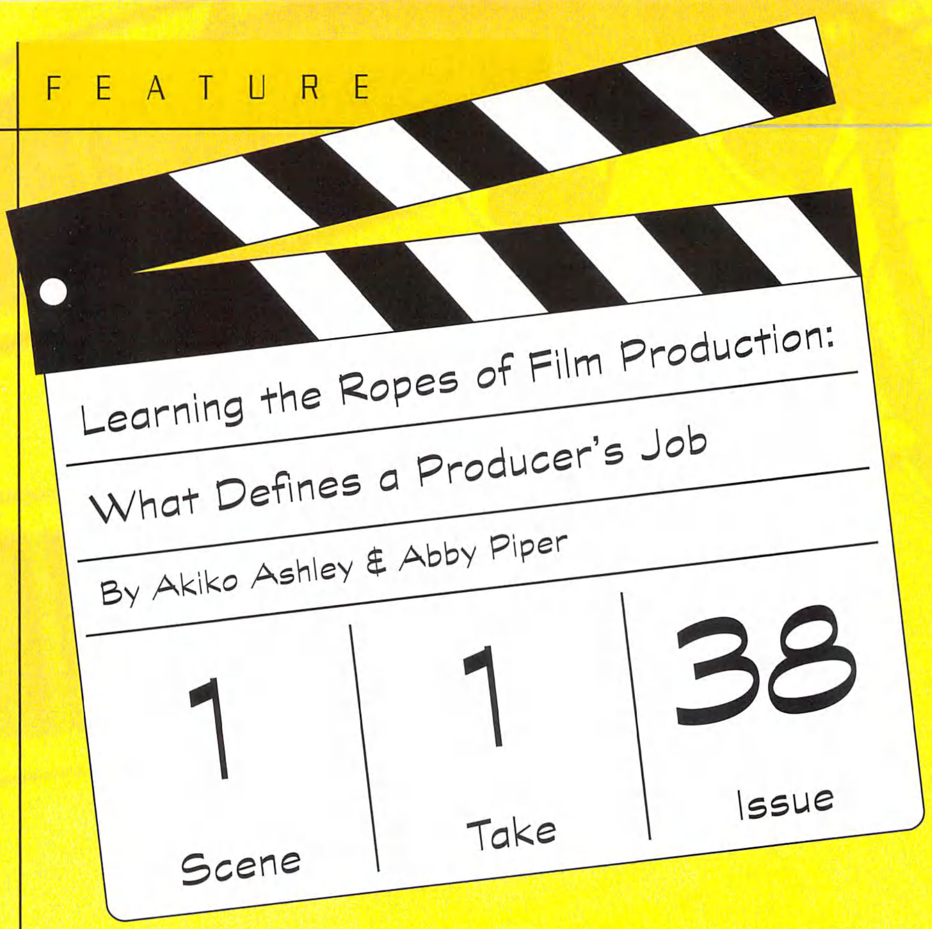

BLOSSOM in bloom AGAIN
What's new
New slate roofing
New seating
Historical data
How slate roofing is made

ANOTHER EXAMPLE OF JEMAL'S INFORMATION GRAPHICS

JEMAL BRINSON HAS BEEN A STAFF ARTIST FOR SIX YEARS AT THE AKRON BEACON JOURNAL NEWSPAPER, WHERE HE IS CURRENTLY INCORPORATING LIGHTWAVE 3D IN THE NEWSROOM ART DEPARTMENT. HIS SPECIALTY IS INFORMATION GRAPHICS.

HE HAS WON AWARDS FROM THE SOCIETY OF PROFESSIONAL JOURNALISTS, ASSOCIATED PRESS AND CREATIVITY FOR HIS INFORMATION GRAPHICS.

JEMAL RESIDES IN TALLMADGE, OHIO, WITH HIS WIFE. WHEN NOT IN FRONT OF A COMPUTER SCREEN, HE ENJOYS PLAYING TENNIS, RIDING HIS BIKE, JAZZ, A GOOD GAME OF CHESS, AND (AS HIS WIFE WOULD SAY) JUST TRYING TO STAY OUT OF TROUBLE.



Learning the Ropes of Film Production: What Defines a Producer's Job

By Akiko Ashley & Abby Piper

INTRODUCTION

A person making it in the motion picture business, regardless of the desired position, must be prepared. You need to have original, creative ideas, aggressive persistence and strategic planning. The film business brings still images to life with cutting edge technology and talent. The person who guides that technology and talent is the Producer.

The Producer gets the ball rolling with their vision of the project. The Producer has the responsibility of creating a blueprint of a project, and insuring the financial status of the project by surrounding the project with award-winning talent. How does a producer get started? As baffling as it can be, there is no master guide to follow when crafting elements together to create the ultimate, successful blockbuster.

Basically, there are five main stages in creating successful films. The process starts in the developmental phase, and finalizes when the distribution deals are completed.

DEVELOPMENT TRACK

Film executives who are in the beginning stages of production start at the development track. The search for a workable script is done first. Once a script is found, a Producer begins to work with the writer to refine and polish it. The script is also the foundation of getting financing and negotiating early distribution. The script may go through many writers and changes to build the perfect vehicle for a studio. Studio executives may add additional comments and suggestions to make the script a marketable prospect for their roster of films. The most important element of screenwriting is the ability to tell a story that translates well on the screen.

In the early stages of the process, the development team finds the essential elements that will lead to getting the film made. Early development includes budget development, finding the crew who will deliver the film and preliminary storyboards and concept art.

Depending on the type of film you are creating, development responsibilities can include other aspects of filmmaking as well. Once the script is finalized, the Producer can pitch the script for financing from a private sector or studio.

PRE-PRODUCTION

Producers are responsible for finding financial resources to get a film made. In Pre-Pro, Producers have usually sold their pitch for the first stage of financing and can move the film forward. Producers begin packaging the film to build a strong foundation for making the film attractive to marketing and distribution executives. The types of people that a Producer must have relationships with include and are not limited to financiers, agents, managers, studio executives, directors, talent and more. If the Producer can add bankable names to a package, this helps make the film more feasible to a studio financier or to independent financiers. It is a very important stage in the production process, because the future of the entire project relies on the elements in Pre-Production.

Pre-Production is where creative concept work is finalized. Storyboarding, concept art, animatics, location scouting and art direction are usually completed at this stage. The early elements of the film begin to take shape. The Producer creates a budget and schedule based on these elements and begins to hire the essential crew and attachments to get the film made. Studio executives will work closely with the Producer and approve all stages of the budget and schedule.

PRODUCTION

Production is a roller coaster of ups and downs for the Producer. After Pre-Pro, the Producer will have proven that the film is marketable and will get the next "green light" for Production. The team he has hired, from Director, to Editor, to Cinematographer, to Intern, must work like a symphony to create the film from the creative elements in Pre-Pro. In live action, principal photography is shot and all the special effects sequences are completed. Visual effects elements are sent off to VFX studios to complete with live action footage that has been shot in production. In CGI production, this will be different since you are working with elements created on a computer. This is where modeling, animation, lighting, and layout are all finalized and put together. Producers may have very little involvement in Production, depending on the studio and the production situation.

POST-PRODUCTION

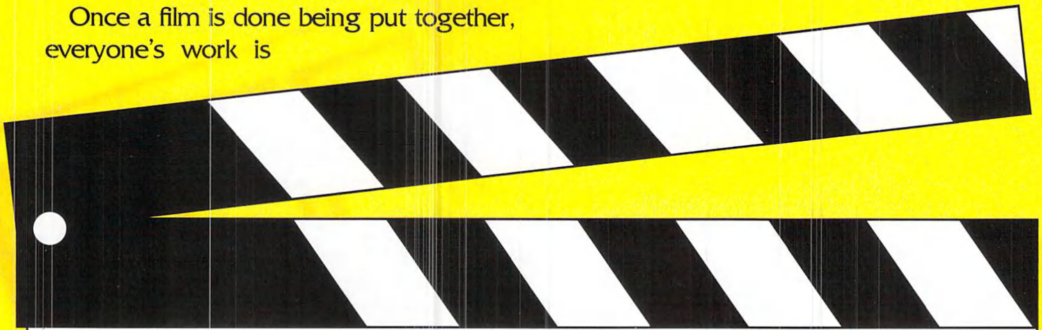
A Producer may hire the Editor and Post-Production team for a film. At this stage, the Producer must trust their instincts and the talent they have hired. This is usually the place where the footage of the film goes through its final edit. Compositing and rotoscoping are also part of Post-Production. In live action, this is where the visual effects and special effects elements are finalized and tweaked. (In smaller productions, VFX is done only in Post.) Post-Production is also the stage where you can make changes to your final edit and rework the story from the footage you shot. Titling for the film is usually done in Post, but can also be done during Production. A good edit and final touch in Post can make or break a film. The Producer may have little say in Post but this is also dependent on the situation.

MARKETING & DISTRIBUTION

Once a film is done being put together, everyone's work is subjected to last critiques and criticism. The marketing department screens the movie to see if it can be sold, and uses these screenings to devise marketing and public relations strategies to sell the film to the public. Press screenings are done for the news media and to pump hype into the opening weekend frenzy.

The Producer will be done with Distribution agreements and should know when and where the film will open. Distribution is when the film is sent to the movie theatres for audience viewing. Distribution is divided into United States, Canadian and foreign markets. The major studios own theatres, so some projects get distribution deals earlier on in the production process.

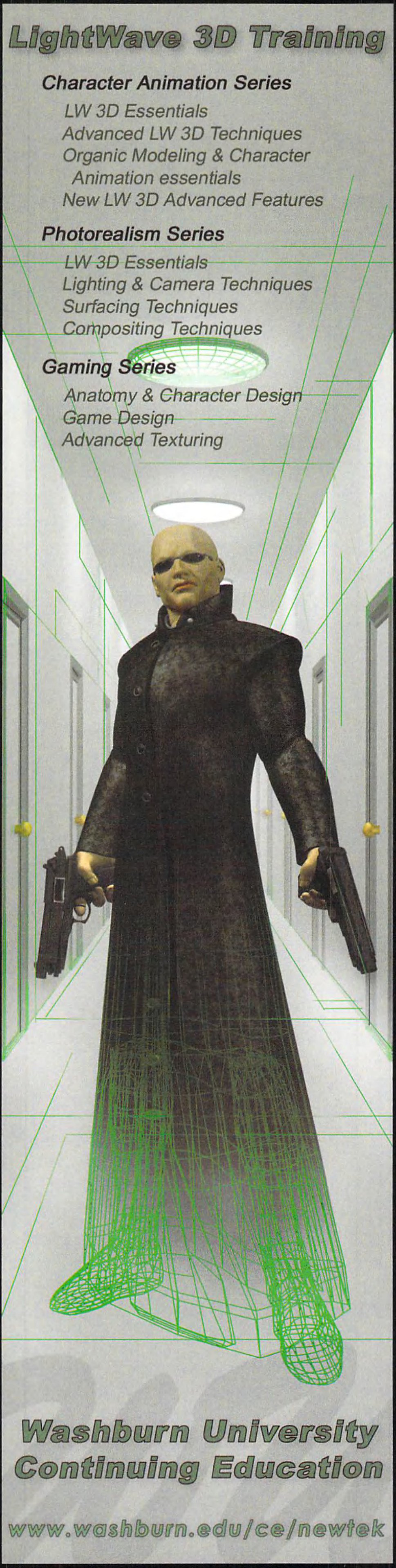
As you can see, the job of a Producer is one that encompasses an array of responsibilities. For the hard worker who likes to be involved in all aspects of a project, Producing can be an exciting path to follow. ■



AKIKO ASHLEY IS ONE OF THE FOUNDERS OF LUMINETIK 3D ANIMATION AND VFX STUDIO. AKIKO HAS WORKED IN THE ENTERTAINMENT AND TECHNOLOGY INDUSTRY FOR YEARS. SHE STARTED HER CAREER WRITING GAMES FOR NINTENDO IN JAPAN IN THE EARLY 80'S. AFTER SHE LEFT JAPAN SHE WORKED IN THE MUSIC INDUSTRY DISCOVERING NEW CREATIVE TALENT. SHE DECIDED TO START HER OWN TECHNOLOGY CONSULTING FIRM IN NEW YORK CITY IN 1994. AKIKO'S DIVERSE BACKGROUND WAS A BIG ASSET TO THE LUMINETIK TEAM. AKIKO JOINED LUMINETIK IN THE YEAR 1999. AKIKO WROTE LUMINETIK'S BUSINESS PLAN, MARKETING & PR STRATEGIES AND BUILT THE COMPANY'S TECHNOLOGY ALLIANCES. AKIKO IS AN EXECUTIVE PRODUCER ON SUCH RECENT PROJECTS AS VFX WORK ON THE CASTLEROCK/WARNER BROS. MOVIE "TWO WEEKS NOTICE," FOUR COMMERCIALS FOR ARM AND HAMMER FEATURING NEW YORK YANKEE JASON GIAMBI, AND CGI WORK FOR NATIONAL GEOGRAPHIC ON "SNAKE WRANGLERS." LUMINETIK'S VISION IS TO BE A ONE STOP PRODUCTION SOLUTION, AKIKO IS CURRENTLY BUILDING THE MUSIC DIVISION OF THE COMPANY WITH PARTNER COLIN GIBBENS. LUMINETIK WAS ONE OF THE CO-SPONSORS OF NYDV EXPO AT MADISON SQUARE GARDEN IN 2003 AND PRODUCED THE COMMERCIAL FOR MIND SHARE VENTURES. FOR MORE INFORMATION ABOUT LUMINETIK, PLEASE GO TO WWW.LUMINETIK.COM.

ABBY PIPER IS FROM NEW YORK CITY. SHE IS A COLLEGE GRADUATE WITH A BACHELOR'S IN JOURNALISM. SHE IS A FREELANCE WRITER AND HAS BEEN WORKING IN NEW YORK FOR THE PAST COUPLE OF YEARS. ABBY'S FOCUS IS IN THE ANIMATION AND ENTERTAINMENT INDUSTRY. SHE IS CURRENTLY FREELANCING WITH THREE PR COMPANIES.

That's a wrap!



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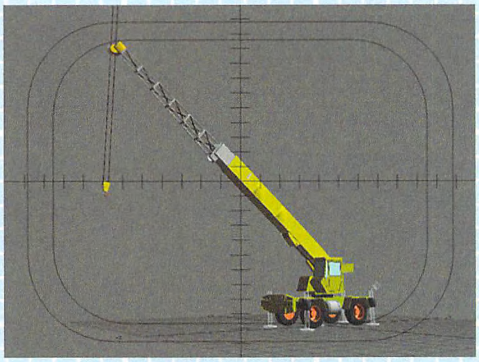
SIMPLE AS IT GETS: EXPRESSIONS

BY ERIC CHARD

NO NEED TO FEAR EXPRESSIONS. A QUICK & EASY WAY TO USE THEM

No groundbreaking techniques here, just a little something to make newbie animators more comfortable with that terrible object of fear … expressions.

Awhile back I had a client with an animation that allowed me to get my feet wet in using Expressions. I confess: I'm expression-phobic. Even reading clear descriptions causes my head to become heavy and my sight to grow dim. However, at my advanced age I've come to realize that almost anything can be learned if it is approached via baby steps. This animation assignment had some simple problems amenable to solving via expressions, so I figured it might be a good place to start learning.



FIGUREO1: SMALL CRANE

In my test case, there's a small construction crane. There are two smallish challenges to animating this crane:

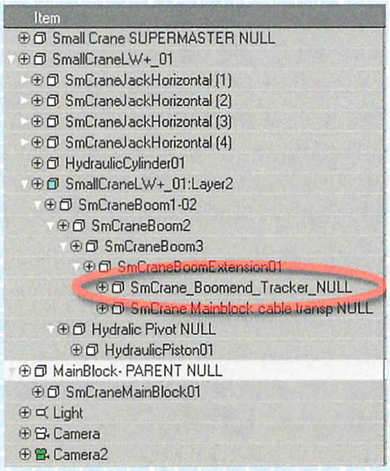
1. Making the crane hook hang correctly.
2. Easing the task of animating the stabilizing jacks.

THE HOOK

The problem with the hook is that it has to follow the path of the end of the boom, but always remain underneath the end of the boom. Phrased another way, the hook has to inherit the position of the end of the boom, (Geez, enough! Henceforth, it's "boomend," OK?) but ignore the rotation of the boom.

It's this last reason that we can't simply parent the hook: then the rotation would be inherited by the hook and its "flexible" cable. That won't do!

Check out the heirarchy of the crane object:

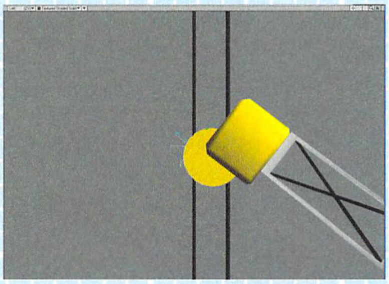


Item
- Small Crane SUPERMASTER NULL
- SmallCraneLW+_01
  - SmCraneJackHorizontal (1)
  - SmCraneJackHorizontal (2)
  - SmCraneJackHorizontal (3)
  - SmCraneJackHorizontal (4)
  - HydraulicCylinder01
  - SmallCraneLW+_01:Layer2
    - SmCraneBoom1-02
      - SmCraneBoom2
        - SmCraneBoom3
          - SmCraneBoomExtension01
            - SmCrane_Boomend_Tracker_NULL
            - SmCrane Mainblock cable transp NULL
      - Hydralic Pivot NULL
        - HydraulicPiston01
- MainBlock- PARENT NULL
  - SmCraneMainBlock01
- Light
- Camera
- Camera2

FIGUREO2: CRANE SCENE EDITOR

The crane's boom has two telescoping sections, plus a smaller extension on the end of the last section. The entire boom can tilt up and down, and the telescoping sections can slide in and out. (This is a good place to remind you that you can save a lot of headaches for yourself by turning off those channels that are not appropriate for a given object: e.g. since the telescoping sections are only supposed to move on their Z-axis, turning off X and Y and all the rotation and scaling channels will prevent you from accidentally moving it in an inappropriate direction.)

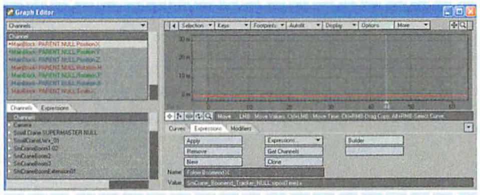
To give myself an actual object to track, I add a NULL to the end of the boom hierarchy. It is "SmCrane_Boomend_Tracker_NULL" in the scene.



FIGUREO3: LOCATION OF " SMCRANE_BOOMEND_TRACKER_NULL"

The plan is to create another null which will be the parent of the hook&cable (all one rigid LWO, actually). This new null is semi-parented (actually, "childed," but that nomenclature war has long been lost) to the Tracker_NULL via expressions. Using yet another null gives more control — since the hook&cable (all one object) won't be directly semi-parented to the Tracker_NULL, it will slide up and down the new null, "MainBlock- PARENT NULL."

To make the "MainBlock- Parent NULL" inherit the XYZ positions of the Tracker_NULL is the simplest of expressions. After generating the null, I open the Graph Editor.



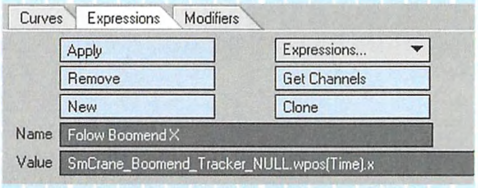
FIGUREO4: THE POWERFUL AND AWESOME GRAPH EDITOR. MAKE IT YOUR FRIEND.

Click the "Expressions" tab in the main window. I am generating three simple expressions, one for each of the XYZ coordinates.

Loop here: Do This Three Times
I selected the X channel of the MainBlock- Parent Null, clicked on NEW in the Expression tab, and entered FOLLOW BOOMEND X in the "Name" box.

Sliding the list on the lower leftside down, I see the tracking object is "SmCrane_Boomend_Tracker_NULL." Oy! Next time I'll make it a shorter name! In the "Value" box I enter the expression itself:

"SmCrane_Boomend_Tracker_NULL.wpos(Time).x"



Name Folow Boomend X

Value SmCrane_Boomend_Tracker_NULL.wpos(Time).x

FIGUREO5

Like I said above, except for a constant value, this is about the simplest an expression gets: grab a value ("wpos" or "world position") at the present time ("Time") for the X channel ("x") of a specific object ("SmCrane_Boomend_Tracker_NULL").

(There's two different, yet similar, syntaxes used for expressions in LightWave: I'm using the old style expression syntax here, because A) I could find examples of it to copy, B) there doesn't seem to be any advantage to using the newer, slightly clearer "Bracket Syntax," and C) only the older syntax allows you to update in realtime.)

At this point, I hit the "Apply" button, and the Value is applied to the selected channel. The expression I've created is now available for any channel, anywhere in the scene. Dubiously useful in this example, since it's so specific.

Now I've matched the hook&cable's parent's X channel to the WORLD position (wpos) of the boomend tracker. That WORLD is all-important, since otherwise we'd be tracking the keyframed position of the tracker's LOCAL position, and that would be boring since it doesn't even move. That is, it doesn't itself move relative to its parent, the boom, since it has no keyframes, but it IS moving through the WORLD as the parent boom tilts, telescopes and rotates. Which is the whole point.

Testing the setup shows me the "MainBlock- Parent NULL" following the boomend tracker around, coinciding with the X position perfectly. I watch it for a second — weird, motion with no keyframes!

One channel down, two to go. I repeat the above for the Y and Z channels, substituting Y and Z in the appropriate places. Since the object's name is so cumbersome, I simply cut and paste and save myself a lot of typing.

Once I'm done, I've got two null objects nestled together, just like they've been parented together, but the child doesn't rotate at all. Thinking about it, possibly the child should rotate on the Heading axis, so as to turn with the boom, which would make the hook turn with the boom, but as a practical matter, in THIS animation it doesn't make a difference. I attach the hook-and-cable object, and it's done.

THE JACKS

The deal with the jacks is, there's four of them, each with two pieces. That's eight things to animate. No reason that can't be reduced to two things, using expressions

I decide to use the left front jack as the "Master Jack" — motion by its two components will be mimicked by the other three jacks.

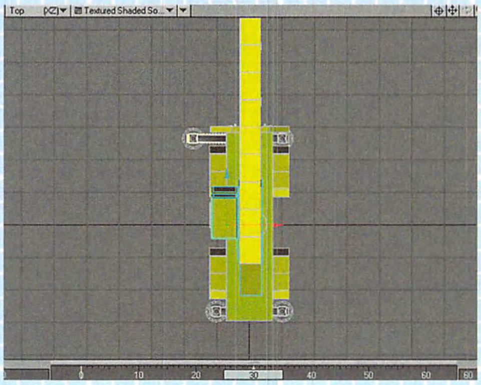
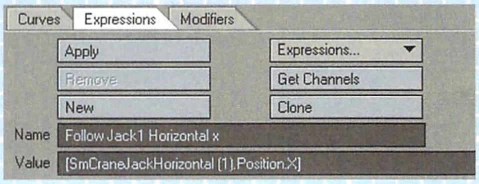


FIGURE06: THE LEFT FRONT JACK WILL BE THE MASTER OBJECT

I select the "SmCraneJackHorizontal(1)" object in the Graph Editor. In the Expressions tab, I create a new Expression and call it "Follow Jack 1 Horizontal x." If you have a channel displayed in the Graph Editor's Channel Bin, right-clicking on it will give you a menu that includes, at the bottom, "Append to Expression." This appends the channel, in Bracket syntax, onto whatever's in the "Value" box of the current expression. Since the Value box is empty, we get only the channel.

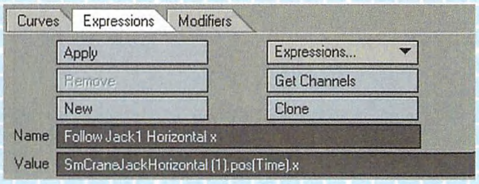
This is great if you are using Bracket syntax, but in our case it's merely handy for getting the correct spelling of the object. (It's EXTREMELY easy to make a difficult-to-spot error when typing names into the Value box, especially if there's some arcane naming convention or even simply clone-indicating brackets. In the preparation of this article I repeatedly made errors that I couldn't spot, so take all the help you can get in inputting names correctly.)



Name: Follow Jack1 Horizontal x
Value: [SmCraneJackHorizontal (1).Position.X]

FIGURE07: VALUE BOX USING BRACKET SYNTAX

I convert the Bracket syntax to what the manual calls "Channel Expression" syntax (LightWave 7.0 manual, section 8.45) by removing the brackets and adding the appropriate function:

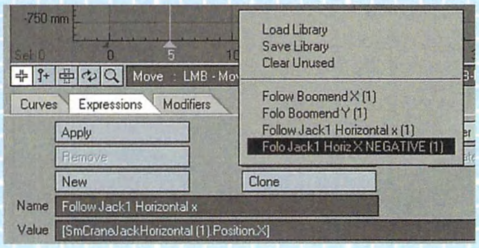


Name: Follow Jack1 Horizontal x
Value: SmCraneJackHorizontal (1).pos(Time).x

FIGURE08: VALUE BOX USING CHANNEL EXPRESSION SYNTAX

Like I said, the right-click append feature is, in this case, merely handy, but if you were using Bracket syntax it'd be convenient. Note that here we are NOT using the "World Position" function wpos, but just the regular pos function, which returns position values relative to the object's parents. Unlike the dangling hook&cable object, the jacks are rigidly attached and must travel relative to the crane body.

Just for paranoia's sake, at this point I save an expression library by selecting "Save Library" from the "Expressions" drop-down list. Now my work is safe.



Name: Follow Jack1 Horizontal x
Value: [SmCraneJackHorizontal (1).Position.X]

FIGURE09: SAVING AN EXPRESSION LIBRARY

Double-clicking the 2nd jack's name in the GE's Scene List puts all its channels in the channel bin. I highlight the X channel, select my new expression, and then apply it.

This works, after a fashion. A very bad fashion, like in the '70s. Jack #2 is following, but since Jack #1 is on the opposite side of the crane, what I really want Jack #2 to do is move an equal amount in the opposite direction. Fortunately, since the crane is a symmetrical object, this is no big deal. (It's not hard to imagine situations where this wouldn't be the case -- but that's for another article.)

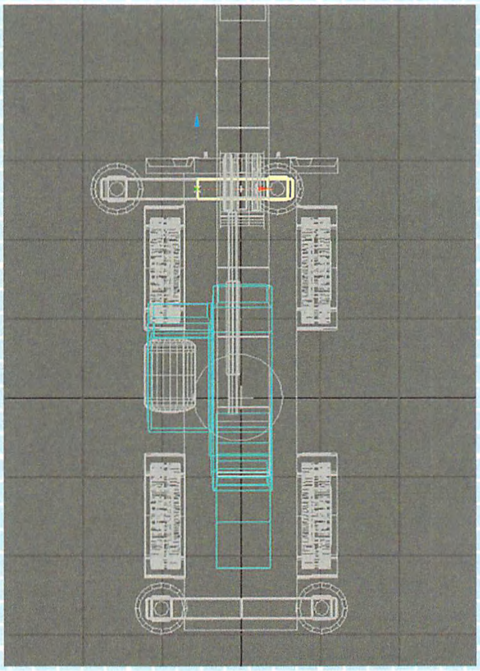


FIGURE10: FOLLOWING THE WRONG WAY

To make the new "Go Opposite" expression, it's merely necessary to multiply the old expression by "-1," that is, negative one. Since I'll need the old expression for Jack #3, rather than alter the one I already have I simply copy/paste the old expression into a new expression named "Follow Jack 1 Horizontal X NEGATIVE," and add "* -1" (that is, multiply by negative one) at the end. Simple. Leave spaces between operators like "*" and "-" so you don't confuse the expressions parser.

I apply the original expression to Jack #3, and the new, negative version to Jacks #2 & #4. Playing the animation, all the jacks' horizontal members move in unison. That "no keyframe" thing still weirds me out.

By now, making the final expression to control the vertical member of the jacks is trivial: I'll grab the Y channel off Jack #1's upright, convert to Channel Expression syntax, save the expression, and then apply the expression to all the vertical jack members' Y channels. The vertical members all travel in the same direction, so there's no need for a negative version of the expression like there was for the horizontal member.

Now, to deploy all the jacks simultaneously, I need only animate Jack #1.

THE VANISHING CABLE

There's one more issue that needs to be addressed: the cable after it "goes" over the top of the pulley. In reality, it is pulled down the boom onto a drum. We are simply going to make it vanish. Otherwise it would extend into the space above the boomend pulley.

To make the cable vanish, I'm going to use a clip map. This clip map only needs to be one, count 'em, ONE pixel wide! I'll make it fifty pixels tall though, because I don't want the transition point to blur too much, and in my experience even with pixel blending turned off, a two-pixel map would blur quite a bit.

FIGURE11: TWO PIXEL CLIP MAP, MAGNIFIED

Setting up a clip map on such a long, thin object can be confusing, so to make it clearer I add a temporary polygon to the hook & cable object that will allow me to see the effect of the clip map more easily.

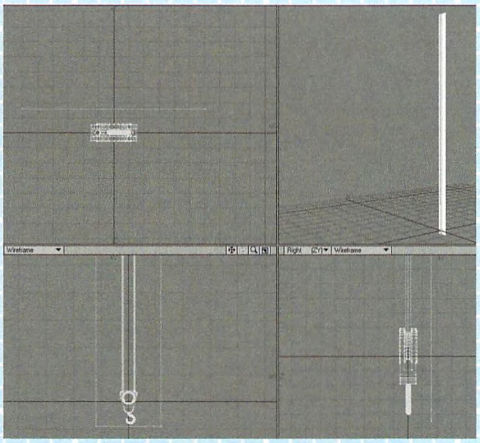


FIGURE12: TEMPORARY POLYGON IN MODELER

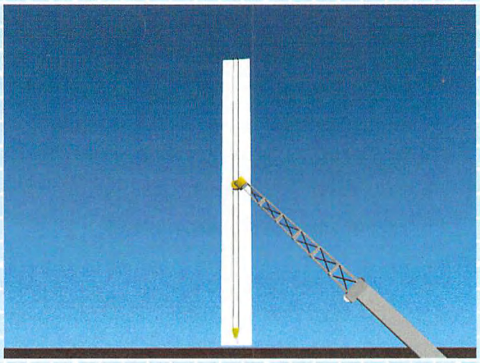


FIGURE13: TEMPORARY POLYGON IN RENDER

The only important location in the clip map is the transition; that is, we don't care how far it extends up or down on the cable, only where it switches from clipping to non-clipping, i.e. black to white. I want to be able to fine-tune this point, so I create a null object ("Mainblco NULL") that I'll reference the clip map to, to adjust the transition point's location. This null also gets parented to the Boomend_Tracker_NULL. It's getting crowded in that neighborhood.

I load the two-pixel clip map via the Image Editor. Selecting the hook&cable object (the actual object name is "SmCraneMainBlock01b"), I hit Properties and go to the Render tab. Selecting the "T" button beside "Clip Map," I set the texture layer to "Image Map" and point it at my clip map image. Hitting Automatic Sizing should make the clip map stretch the complete height of the object. I use Planar Mapping on the X-axis. I don't want the map to tile or repeat, so I set the Tile boxes to "Reset."

One of the things that makes clip mapping less than a snap to use is the fact that the effect of the clip map doesn't appear in OpenGL. However, the first image map texture on a surface does appear. I'll use this to guide me in positioning the clip map.

Before I exit the Clip Map Panel, I assign the reference null I created earlier, and then copy the entire layer by hitting the "Copy" button on the upper right, above the layer column.

Going to the Surface Editor, I find the surface for the temporary polygon I created behind the hook&cable object, cleverly designated "CLIP MAP TEST SURF." Beside the Color channel, I click the "T" (for Texture") button. Once inside the Texture Panel, I make sure the first (and only) layer is selected, and hit the Paste button, selecting the "Replace Layer" option.

What I've done here is copy all the parameters of the clip map I'm using for this object into the COLOR channel of the temporary polygon's surface. This will easily allow me to see where the transition point of the clip map is, even though OpenGL doesn't actually display clip map effects, since adjusting the clip map's reference null also adjusts the temporary polygon's color map. (I sure hope there isn't an easier way to do this.)

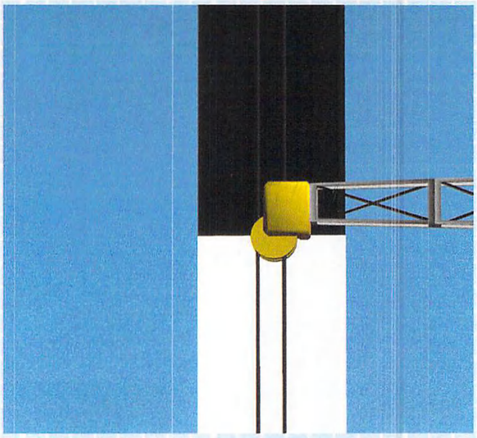


FIGURE14: THE CLIP MAP AS COLOR MAP

Even when you do move the reference object to adjust the clip map, OpenGL won't show you the change until you make a keyframe and move the slider one frame. I usually just animate the reference null within a reasonable range and then play the animation, stopping at the correct frame. Make a keyframe when the clip/color maps is at the correct position, delete all other keys, and "voila!"

Once you've got the color map positioned correctly, you can copy that layer from the Texture Editor: Color panel, and paste it into the Texture Editor: Clip Map panel for the hook&cable. With this particular color choice, you have to check the "Invert Layer" check box to correctly clip the hook & cable.

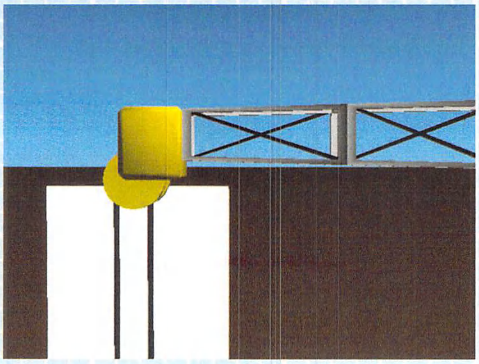


FIGURE15: CLIP MAP ACTIVATED

There's one last thing to do to make this work. You must activate "World Coordinates" in the clip map panel or the texture will drift as the boom moves around. To me this seems backwards, since the texture is referenced to the null object, but there you go. It may have something to do with the fact that the reference null is not keyframed, it's the child of a hierarchy. Maybe texture references must have keyframes to actually move a texture map without using World Coordinates. I do know that once you turn on World Coordinates, it works like a charm.

Before I render the final animation, I'll either delete the temporary polygon I used to help me position the clip map, or I could simply make the temporary polygon's surface 100% transparent, keeping the polygon in case I might need it again.

So there's your tiny introduction to using expressions. Expressions are crazy powerful, but you might need to brush up on your math for anything more complicated than this. For these most simple uses, plug-ins such as "Channel Follower" or "Set Driven Key" for channels, or "Follower" and "LeadTheFollower" in the Motion Panel might make more sense and be easier to use, but they're all just expressions at heart and it's worthwhile to cut your teeth on the simple stuff as training for the more complex tasks you might dream up.

There is also a third-party expression package that's VERY worthwhile, and I've got to say more clearly supported than LightWave's native expressions. It's named "Relativity" and marketed by Prem Subrahmanyam. A quick Google search will find it. Relativity has many powerful and cool features, wizards, examples, and lots of documentation, and Prem himself is active on the LightWave online forums. If you find yourself in need of a lot of expression functionality, investing in Relativity is a smart investment.

(For Resource Files for this tutorial, check out the Keyframe website at www.keyframemag.com.)

ERIC CHARD IS A SEATTLE-BASED VIDEO AND FILM FREELANCER. HE'S BEEN INVOLVED WITH LIGHTWAVE SINCE IT WAS VIDEOSCAPE ON THE AMIGA. ONCE IN BROADCAST JOURNALISM, HE QUICKLY REALIZED THAT PRETTY PICTURES WERE MORE FUN THAN BREAKING NEWS, AND NEVER LOOKED BACK. ERIC IS AN ARIES.

Tales from The Print Side

By Brad Krause

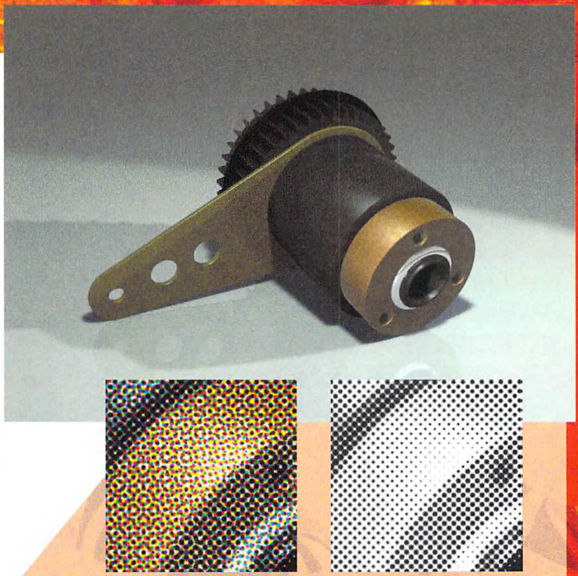
>>Introduction

Print is "Old Media." But it'll get your grandmother to see your work before the Thanksgiving family get-together.

As the point above illustrates, there are both good and bad things about print. Yes, just like TV, film and the Internet. So, if your 3D work has been completely digital, suddenly getting a print job could be extremely frustrating. Take heart.

Print is everywhere. That means that there's plenty of work to be had.

And there's plenty of money to be made. There's even plenty of creative freedom. All you need is a little change of focus and a little study. If you've been doing 3D for a while, then both should come easily to you.



Halftone_example_01.tif, Halftone_example_02.tif, Halftone_example_03.tif: An exaggerated example of what this magazine looks like under a magnifying glass.

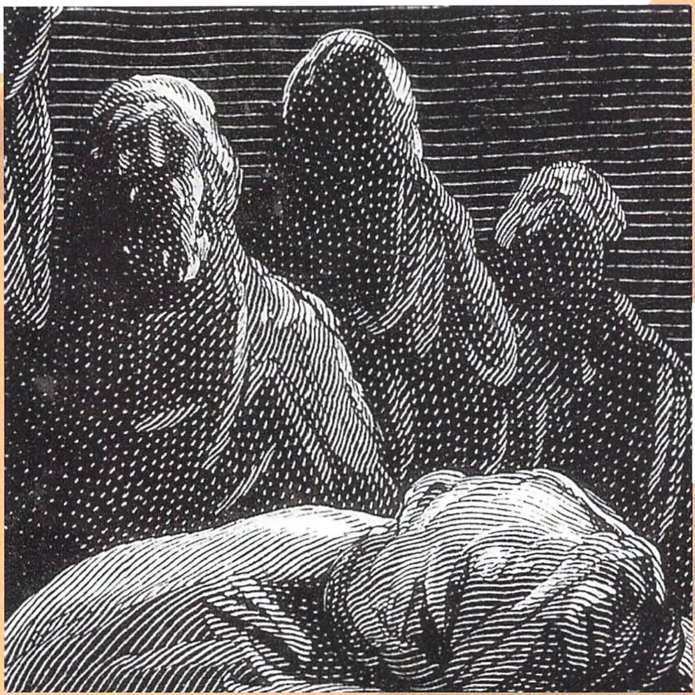
The Basics: How Print Works

For hundreds of years after its invention, print could only duplicate flat color. That color was usually black.

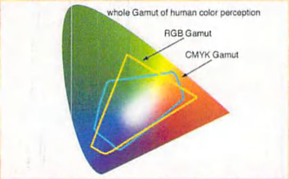
Engravings and wood cuts, like ink drawings, emulated graduated tone with techniques like cross-hatching, dot stippling and graduated line thickness. But these techniques were obvious makedos. Their style, though often beautiful, could never accurately recreate realism. See Fig. EngravingExample.

These days, smooth transitions in tonal value are achieved using the Halftone Dot. This "dot" can be any shape, including square, diamond, or even simulations of the old engraving and ink styles.

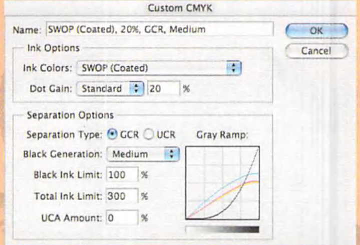
As little as 10 years ago, most halftones were produced photographically, using huge cameras called stat cameras. Like computers 20 years earlier, they took up a small room.



EngravingExample: Illustration from Gustave Dore's Bible



gamuts.tif: Gamut simply means 'range'. The ranges of colors visible using different processes are illustrated in this diagram. Of course it's printed in CMYK inks, so you'll have to use your imagination.


Custom CMYK

Name: SWOP (Coated), 20%, GCR, Medium

Ink Options

Ink Colors: SWOP (Coated)

Dot Gain: Standard 20 %

Separation Options

Separation Type: ● GCR ○ UCR

Black Generation: Medium

Black Ink Limit: 100 %

Total Ink Limit: 300 %

UCA Amount: 0 %

CustomCMYKbox.tif: It took awhile, but you've finally found the heart of color conversion.

Now, making artwork destined for print uses pixels. There are just lots more of them than for video. About 4.166667 times as many per square inch. That's 300 pixels per inch instead of 72.

Print from Digital

The printed "dot" is made up of many pixels. This printed dot is called a Rosette. The more pixels that make up a rosette, the bigger that rosette. Put hundreds of big rosette dots in a small space, the dots merge, and you get black. Take away lots of pixels from each of the rosettes and you get smaller dots. Now that small space is filled with hundreds of smaller dots and the resulting illusion is not black anymore, but gray. A quick look at a printed page with a magnifying glass will show this surprisingly well.

Here I've converted an RGB image into CMYK. I applied the Color Halftone filter in Photoshop and zoomed in on the image to show an exaggeration of this effect. See Halftone_example_01.tif, Halftone_example_02.tif, Halftone_example_03.tif.

Run The Gamut

The 3D artist has the same problem as an artist using a digital camera -- Color Gamut.

In Photoshop, go ahead and open up an image you've rendered. Change its color mode from RGB to CMYK by pulling down the image tab to color mode and choosing CMYK.

If you had some nice bright reds, greens or blues, it will look like they've been turned to mud. This is an accurate representation of what print will do to your images.

Want to see something interesting? Leave the CMYK image on your screen, get up and go do something for a couple of minutes. Come back to your computer and look at the image. It doesn't look bad at all!

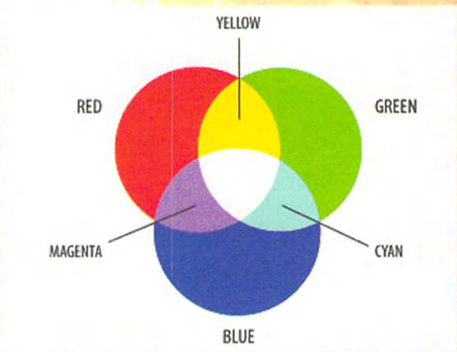
It's all relative. You've been looking at CMYK images all your life. Print is nothing new to you after all. See gamuts.tif.

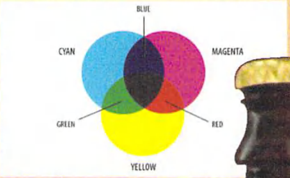
An Image from 3D to Print

Let's follow the process I use to keep print Art Directors happy with my images.

For the original, RGB rendered version of this artwork, you can visit my web site at http://www.radiance-media.com/New.html. Click on the fourth icon from the upper-left.

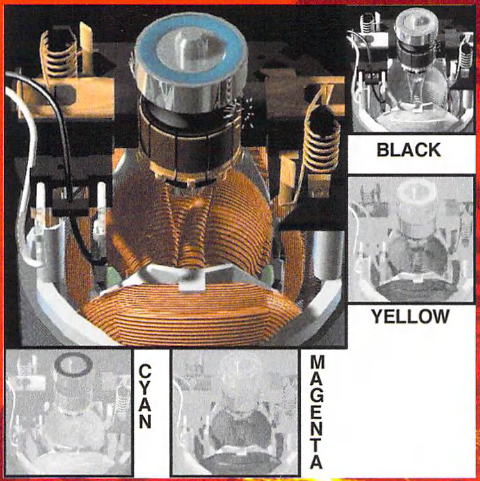
There's very little you can do in LightWave regarding the CMYK color space. This is really a good thing. LightWave gives you one of the most beautiful rendered images without much effort at all. The job of fixing an image that has to undergo the indignities of RGB to CMYK



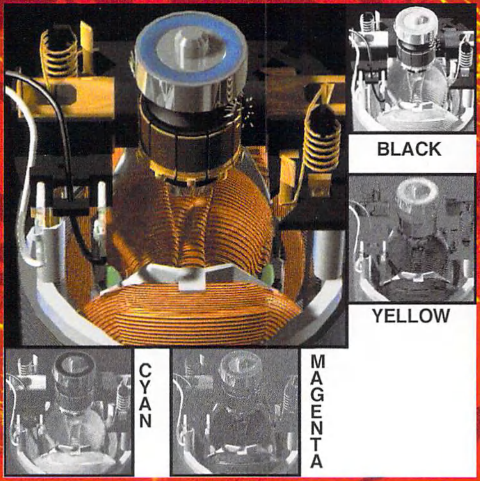


cmyk_model.tif, rgb_model.tif: Add together the three colors used by monitors to simulate visible light and you get white. Add together the four colors used by printers to simulate visible light and you get black.

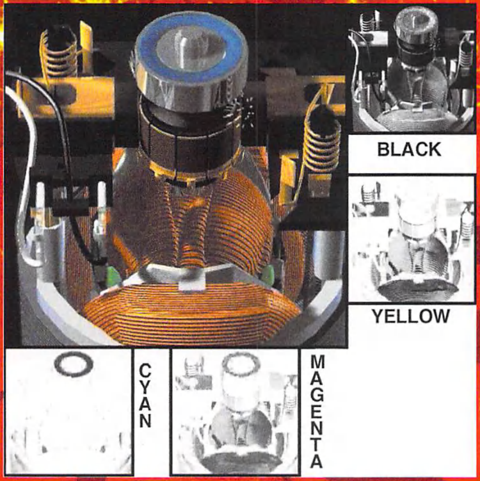
Old Style
HEILEMAN'S
Old Style
BEER
Naturally Carbonated
(355ml)



CMYK CONVERSION_VARIED_HEAVY



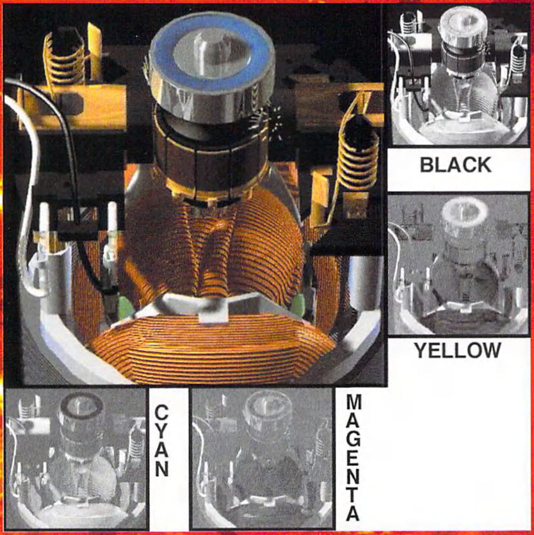
CMYK CONVERSION_VARIED_LIGHT



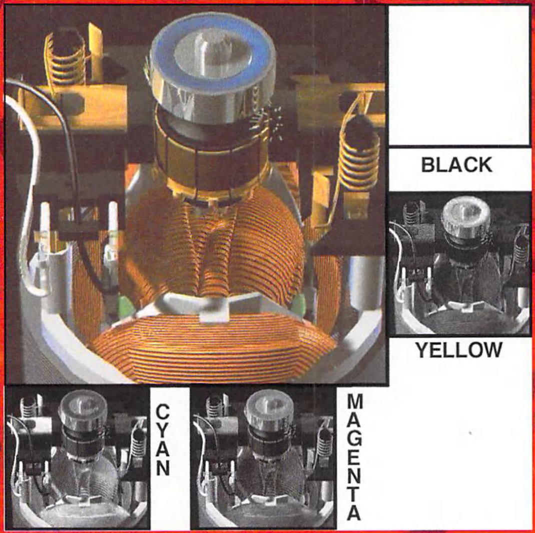
CMYK CONVERSION_VARIED_MAX

VARIED

For images that have a lot of hue and tonal variation, use light to moderate black generation to preserve the subtle hues.



CMYK CONVERSION_VARIED_MED



CMYK CONVERSION_VARIED_NON

conversion really belongs to a dedicated image editing program, Photoshop.

The first thing you should know about color mode conversion in Photoshop is that you can pretty easily control how it comes out. Why should you bother?

Because not everyone who has the job of converting your images will even do it, much less do a good job of it. And what's the result of someone not doing it?

A machine that makes printing plates out of digital artwork will decide. It will use whatever default settings it has. Your image will still work, but its eventual quality is up to the gods of plate-making technology.

In Photoshop, control lies in a well-nested dialog box called Custom CMYK. Let's check out some settings.

Under the Photoshop menu, choose Color Settings. In this box, pull up the menu labeled CMYK to Custom CMYK. See CustomCMYKbox.tif.

One Dialog Box: The Heart of Color Conversion

The heart of color conversion deals simply with how you create black and the hues of all colors. CMYK is a "subtractive" process. The more color you pile on, the darker a color becomes. The opposite is true of RGB, where the more color you add on, the brighter and whiter a color becomes. See cmyk_model.tif, rgb_model.tif.

In the Custom CMYK dialog box, you get to choose what percentage of black goes into creating hues of your colors. In the boxed-in area called Separations, I use only the pull-down menu Black Generation. Medium is the default. Let's try out each of the settings and view the results.

Leave No Hue Behind

You choose your conversion setting with the intent of keeping your colors

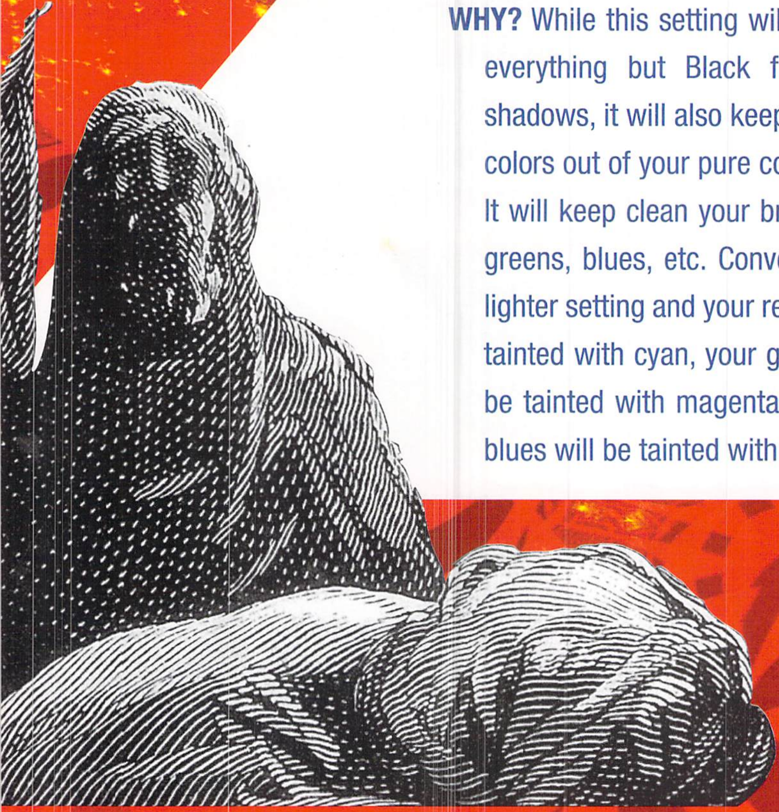
THE SIMPLE RULE IS THIS:

1) Heavy Black Generation: Use with bright colors.

WHY? While this setting will take out everything but Black from your shadows, it will also keep polluting colors out of your pure color areas. It will keep clean your bright reds, greens, blues, etc. Convert with a lighter setting and your reds will be tainted with cyan, your greens will be tainted with magenta and your blues will be tainted with yellow.

2) Light and Moderate Black Generation: Use with subtle colors.

WHY? Hue variation in subtly shaded areas requires the effect of all channels to different degrees. If you used a heavy setting, you'd retain the shading, but the color variation will go out the window.



> “One uses an image I call Bright and the other I call Varied.”

as bright as possible. So when to use which?

Quickly examine the five groups of images below. Each image and its four component channels were generated using the CMYK conversion dialog box's five presets.

Notice how, on the “Maximum” setting, the C,M & Y channels do not contain any shading in any but the brightest areas. Then, over at the group of images using the “None” setting, no black was used at all, even to create black. Using the None setting, the color channels C, M & Y were combined to create the darkest color, not quite achieving black.

As you'd expect, settings “Light,” “Medium” and “Heavy” produced varying degrees of these extremes. The extreme values of Max and None should rarely be used. An example will follow in a bit.

Notice that I have two sets of my color conversion examples. One uses an image I call Bright and the other I call Varied.

What setting you choose depends on whether you judge your image to be composed mostly of bright colors, or subtle variations and shades of the entire spectrum.

And therein lies the final core of color conversion. You don't have to simply accept these presets, but you don't have to get into modifying the curves and other settings in the custom CMYK conversion box through trial and error, either.

Perfecting The Conversion

Press operators have a simple, stringent rule regarding color saturation. 300%.You are not allowed anywhere in your image to have more than 300% ink coverage.

By default, Photoshop is set to abide by the 300% rule. Given that each channel, completely saturated, equals 100%, you can now see why the Black channel will gain while the other three lose. The

300% rule. Something's got to give.

The reasons for this are simply mechanical. First, ink that is built up above 300% coverage will crack after it's dried. If someone bends the page back just a bit, visible cracks will appear in the darker parts of the page.

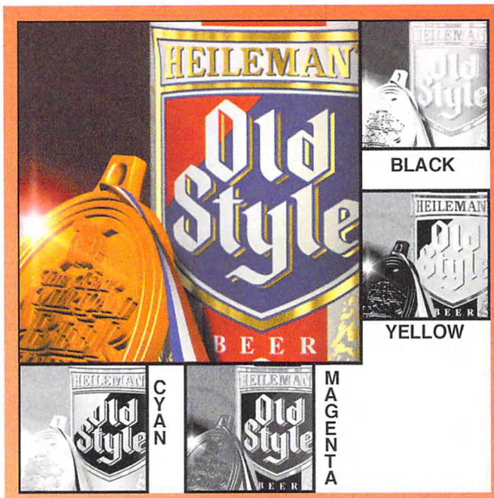
Second, as the page goes through the press and thicker and thicker ink is built up, the printing plates will mash down the tiny, delicate printed dots, blurring your image into a mess.

But just because Photoshop allows you to make conversions that follow the 300% rule doesn't mean your images will come out perfect. Making your image perfect is your job.

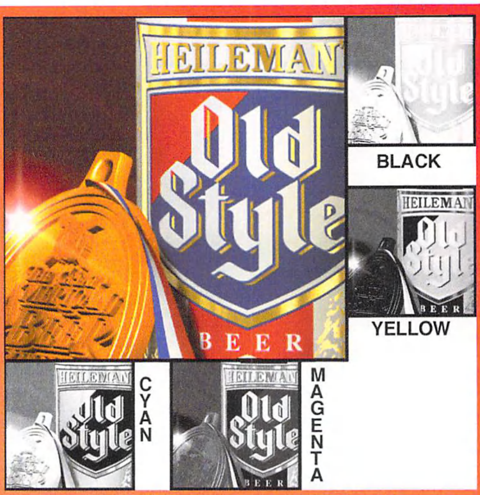
You can make up to five CMYK variations of your image, each with a different conversion setting. Then you can copy channels from one version and paste them into another.

Do you like the variety of hues that a setting of No Black Generation gives your image, but still need a little bit of black? Copy the entire black channel from a version converted using the Light setting. Then paste it into your favored version that was made with the None setting. It will immediately punch it up with the black. Just be careful you don't break the 300% rule too badly.

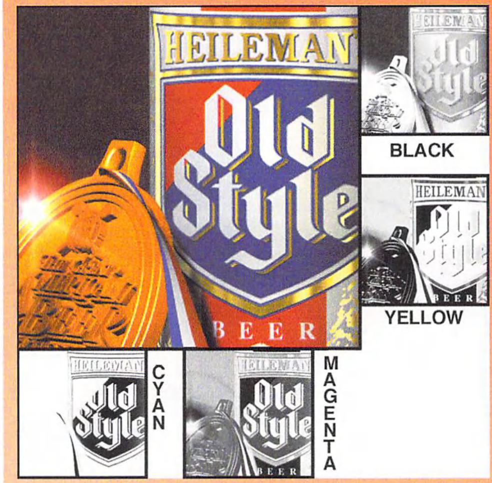
Print work allows you to focus all of your energy onto a single image. All of the little nuances that would be impossible to address over thousands of animation frames can be tweaked, not only for aesthetic reasons, but to make sure that when your image gets into the hands of paying customers, passed around to all their friends, and finally, sealed into an airtight plastic baggie for posterity, no middle-man, manufacturing process, or machine will have done it any disrespect.



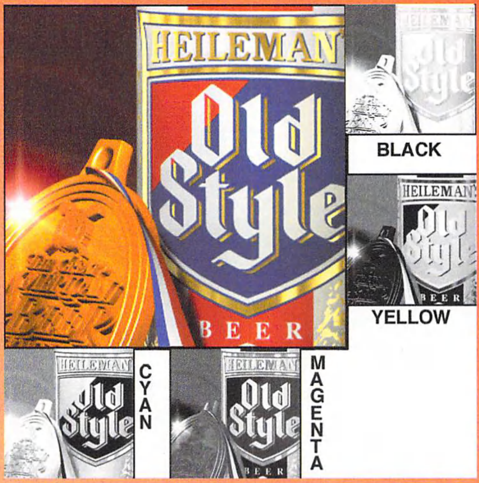
CMYK CONVERSION_BRIGHT_HEAVY



CMYK CONVERSION_BRIGHT_LIGHT



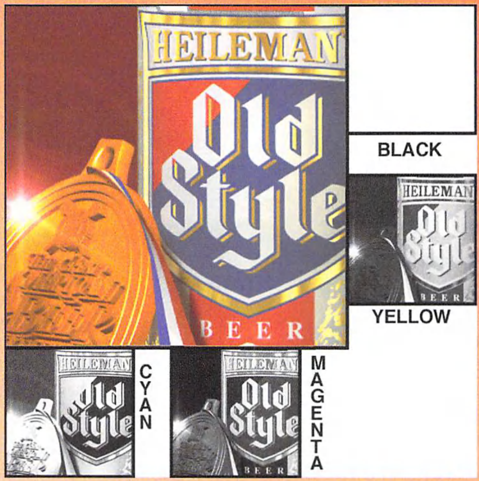
CMYK CONVERSION_BRIGHT_MAX



CMYK CONVERSION_BRIGHT_MED

BRIGHT

For images that are heavy in primary colors and contrast, use heavy black generation in the Custom CMYK dialog box.



CMYK CONVERSION_BRIGHT_NON

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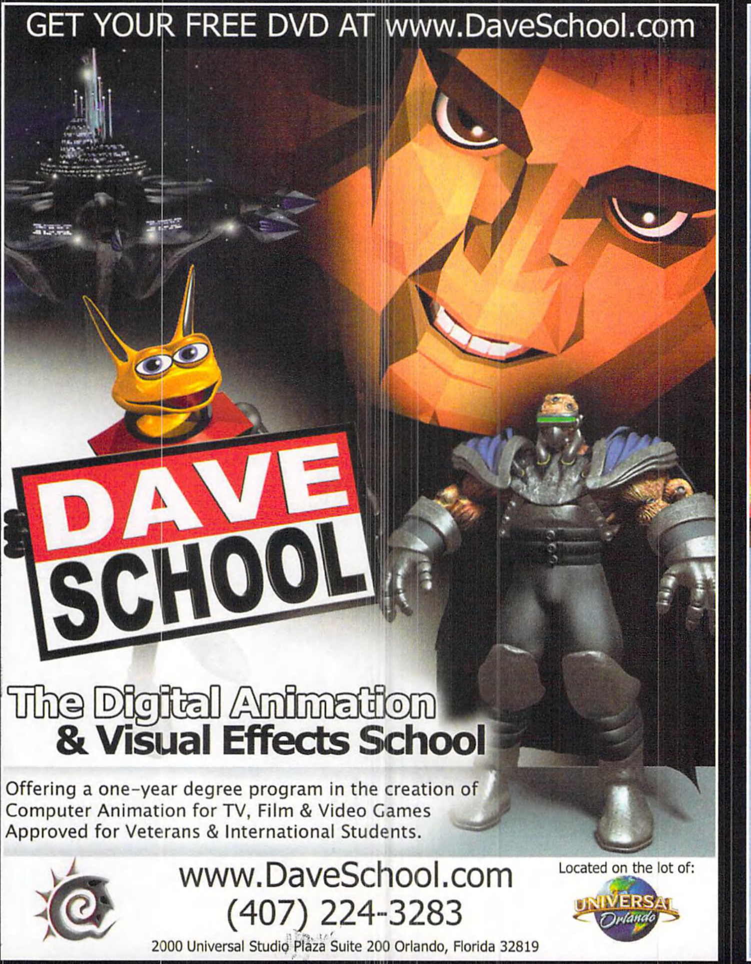

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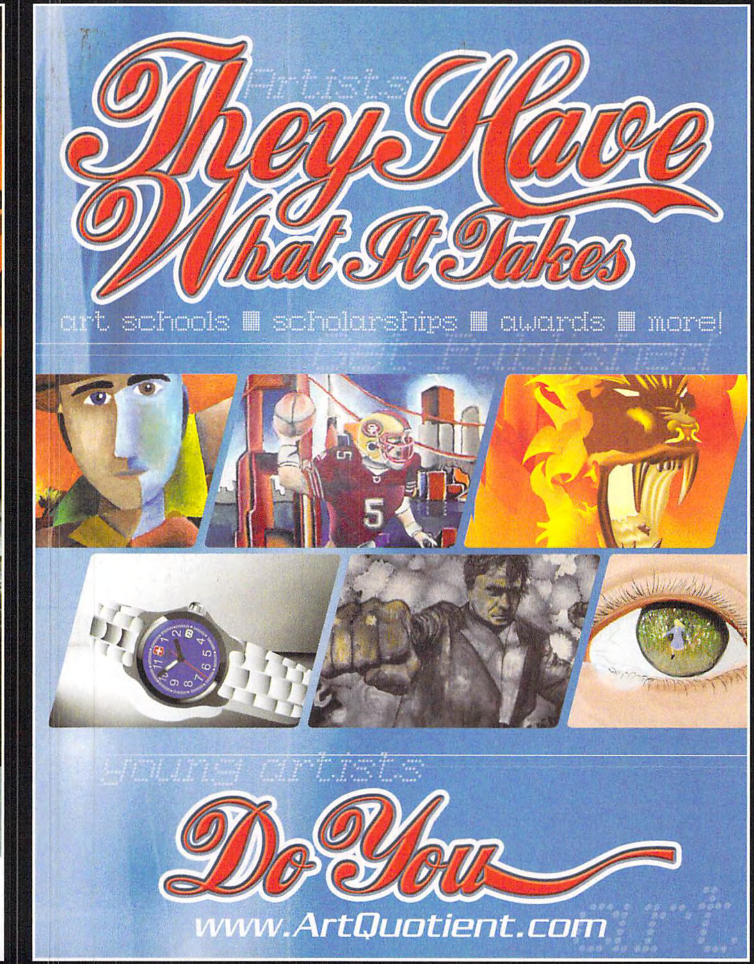

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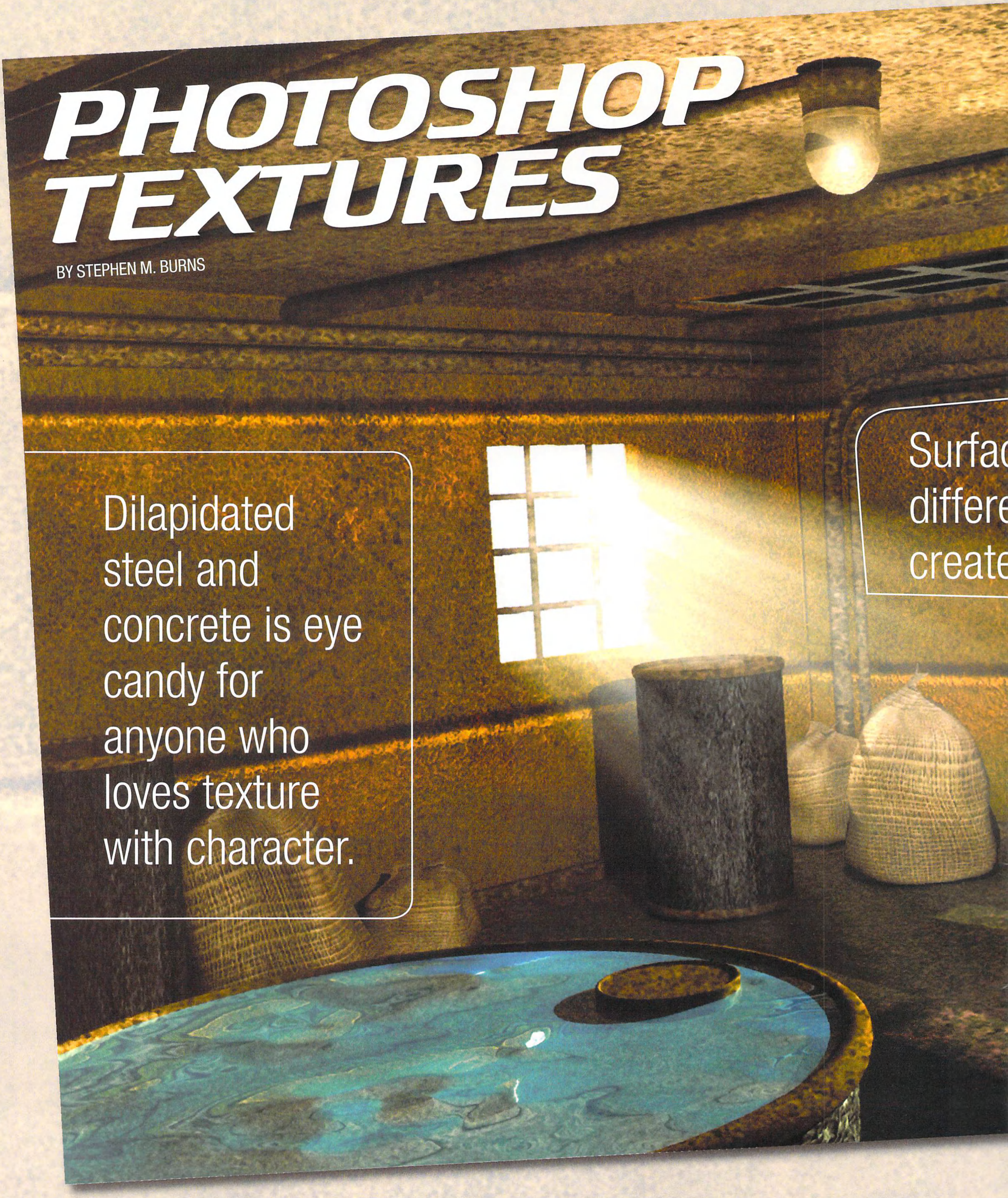
PHOTOSHOP TEXTURES

BY STEPHEN M. BURNS



Dilapidated steel and concrete is eye candy for anyone who loves texture with character.

Surfac
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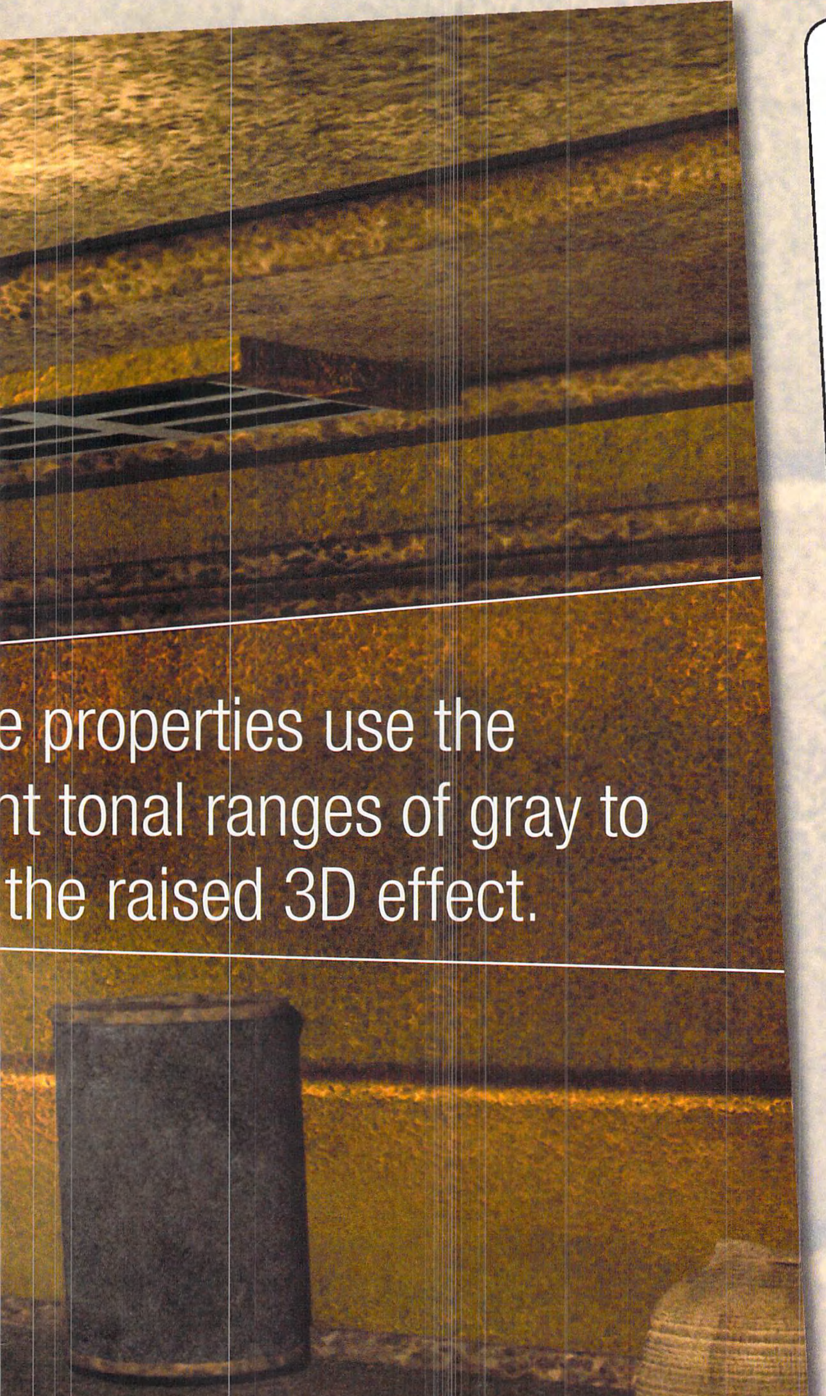


> e properties use the
> nt tonal ranges of gray to
> the raised 3D effect.

DILAPIDATED PLACES

I have always had a fascination with texture. Sometimes I will take an afternoon and go to the beach or the mountains and photograph any sort of texture that I can find. Often times I end up photographing oil slicks on the roads, lichen feeding on large rocks or the texture of tree bark. Although some of these things are interesting, my favorite is to find old abandoned storage shacks or burnt out buildings and document the wonderful textures that these weather-torn structures will provide. The rich, saturated colors of dilapidated and rusting steel walls are ideal for source material. Next time you are on a road trip out to the desert or mountains and you see those old abandoned and gutted-out homes, plan to drive up and document the textures. Make sure to bring a tripod, because most will be in low lighting situations. You want as sharp of an image as possible.

I thought I would challenge myself to see just how closely I could reproduce such effects from scratch in Photoshop CS. In this article, we will explore the use of creating custom animated brushes with the blending modes.

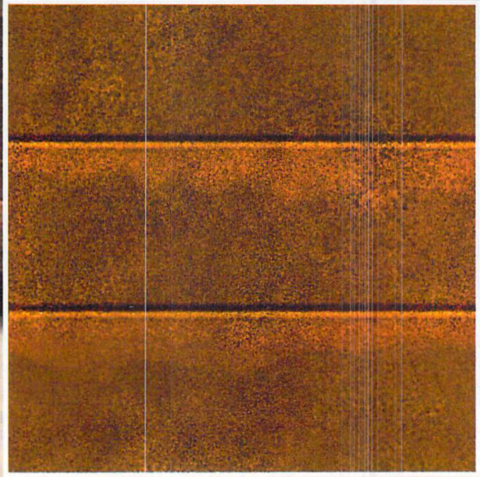
TEXTURING THE WALLS

Dilapidated steel and concrete is eye candy for anyone who loves texture with character. After building my models to represent the abandoned storage facility, I needed to create my textures so that they would tile seamlessly. The three main themes in my scene file are the wall, floor and the burlap bags. So let's begin with the wall.

Step 1

Access the layers pallet (Windows>Layers) and at the bottom, click on the icon next to the "garbage can" symbol. You now have a new layer on which we will create our texture for the wall. One of the more beautiful features of Photoshop CS is its ability to create animated brushes. These are brushes that will create several effects as you paint and they are customizable.

On the tools bar, select your paint brush tool (B). On the preset drop menu at the top horizontal edge of the interface you will see shape options for your brushes. On the right-hand side of the "Brush" text, click on the drop down menu options and choose a brush similar to my example. (Figure 1)



Final Wall Texturing

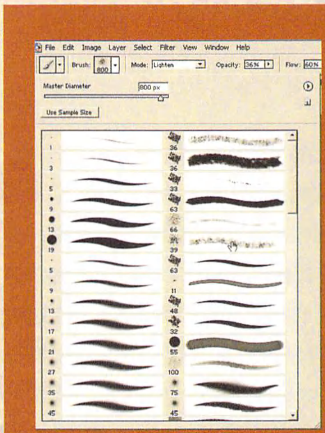


Figure 1

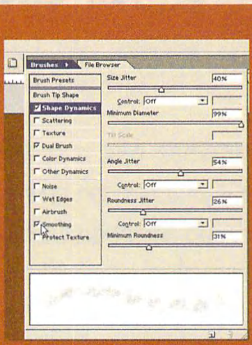


Figure 2

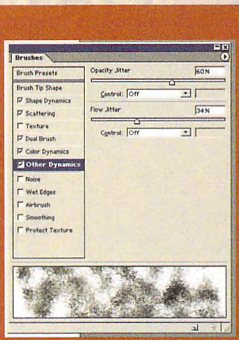


Figure 3

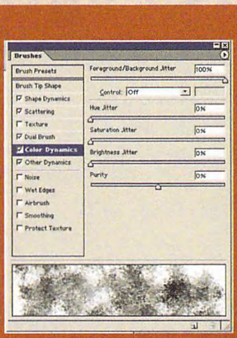


Figure 4

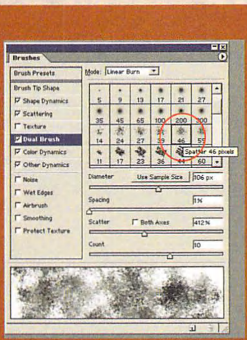


Figure 5

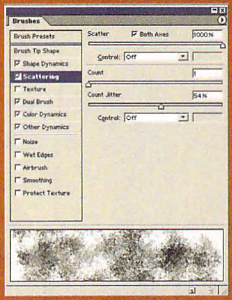


Figure 6

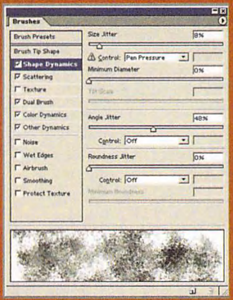


Figure 7

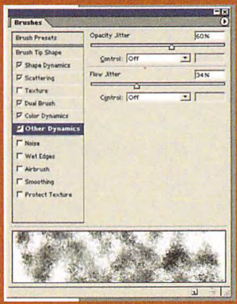


Figure 8

Step 2

Now click on the brush animated pallet box and let's add some effect to your selected brush. (Figure 2)

The effects often use the foreground and background color on your tools bar, so change your foreground color to a deep olive green and your background color to a brownish rust hue. Most of the animated commands use a jittering effect, which varies the size, rotation, intensity and color over time as you click and drag to apply your paint. This requires that you experiment and play to get a handle on the best options for your texture. (Figure 3)

In the animated pallet menu you are interested in five areas:

1) Shape Dynamics – Alters size and rotation

2) Scattering – Alters placement over a specified area

3) Dual Brush – Allows the effects of two brushes in one

4) Color Dynamics – Alters hue over time.

5) Other Dynamics – Alters Opacity over time

In this example, I set my brush so that it scattered the texture without causing a smoothing effect. A preview is provided on the bottom of the options box. You can anticipate what your brush will do from here. The following is what I used to create the beginnings of my wall texture. (Figures 4 - 8)

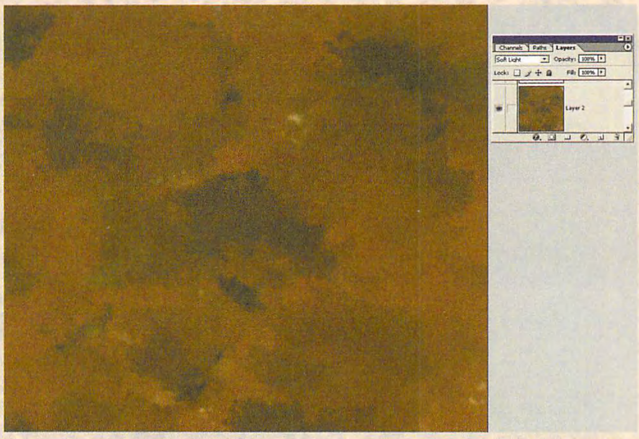
NOW LET'S LOOK AT THE BEGINNINGS OF MY TEXTURE

Step 3

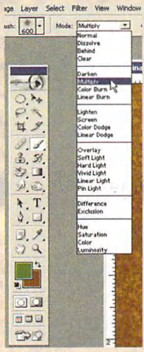
Moving forward, let's change the background color to a lighter shade of brown, and with the brush tool still selected, look on the options bar to the right of the brush size options and change the mode from Normal to Lighten. Use the same animated brush and create the raised effect on the same layer.

Step 4

Next we are going to change the foreground color by resampling. Holding down your Alt/Option key while in the Paintbrush mode will give you the eyedropper. Use this to select a darker texture in your image. Change your brush mode from Lighten to Multiply and paint on your image while varying the size of the mouse. Use ([or]) on the keyboard to achieve this. We are now adding depth to our wall texture.


Beginning of wall Texture

That's it in a nutshell. From here just create other brushes and continue to resample in both Lighten and Multiply mode with a variety of brush shapes and dynamics so that the final image doesn't look so predictable.

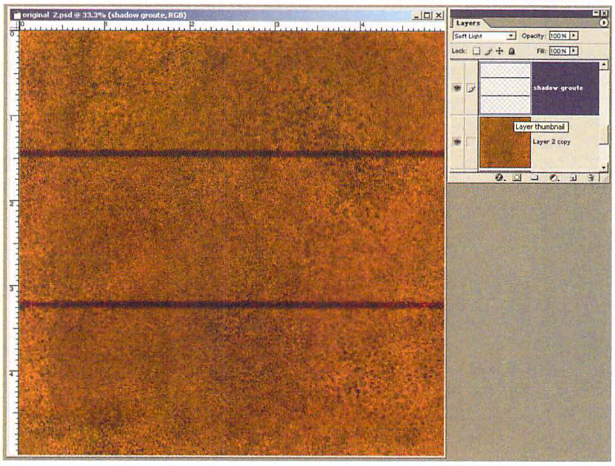


Take a look at my final texture in Brush06.tif

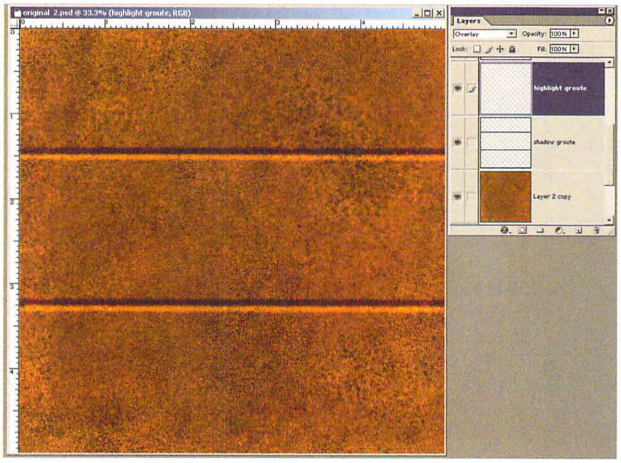
ADDING DETAIL TO OUR WALL TEXTURE

Step 1

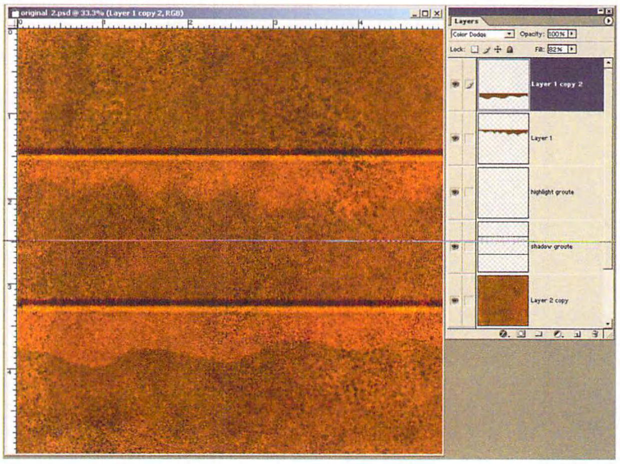
Now we can start adding the detail. Make sure that your foreground color is black and create a new layer. Rename this layer "Shadow Grout" just to keep organized. Place your mouse on the left side of your image about 1/3 of the way down from the top and click and release your mouse. Follow up by placing your mouse on the right side of the screen on the opposite side and hold down the shift key. When you click and release the mouse a horizontal line is drawn between the two points. Do the same 1/3 of the way from the bottom. Finally, set this layer to soft light mode.


original 2.psd @ 33.3% (shadow groute, RGB)
Layers
Soft Light
Opacity: 100%
Lock:
Fill: 100%
shadow groute
Layer thumbnail
Layer 2 copy

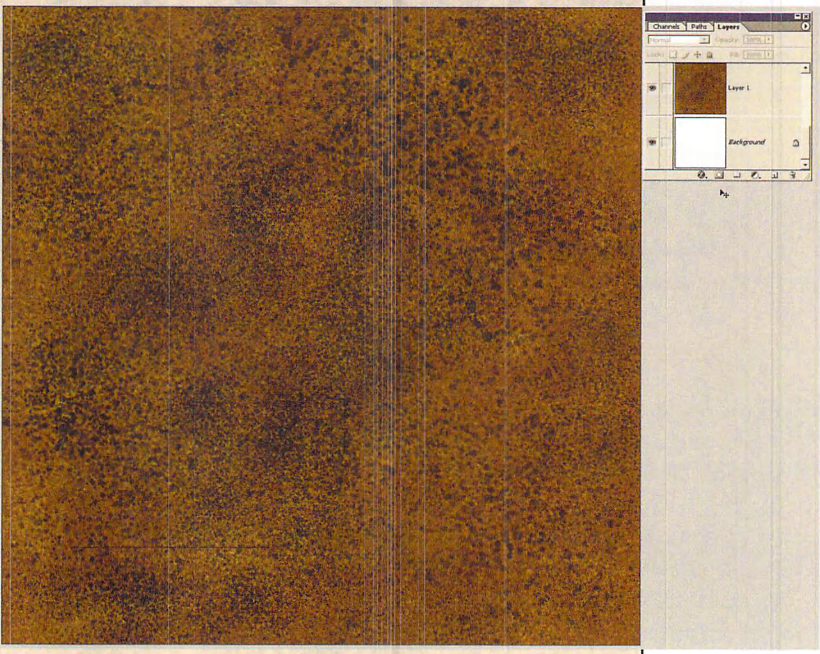
Adding Detail – Step 1


original 2.psd @ 33.3% (highlight groute, RGB)
Layers
Overlay
Opacity: 100%
Lock:
Fill: 100%
highlight groute
shadow groute
Layer 2 copy

Adding Detail – Step 2


original 2.psd @ 33.3% (Layer 1 copy 2, RGB)
Layers
Color Dodge
Opacity: 100%
Lock:
Fill: 82%
Layer 1 copy 2
Layer 1
highlight groute
shadow groute
Layer 2 copy

Adding Detail – Step 3


Channels
Paths
Layers
Normal
Layer 1
Background

Brush06.tif

Step 2

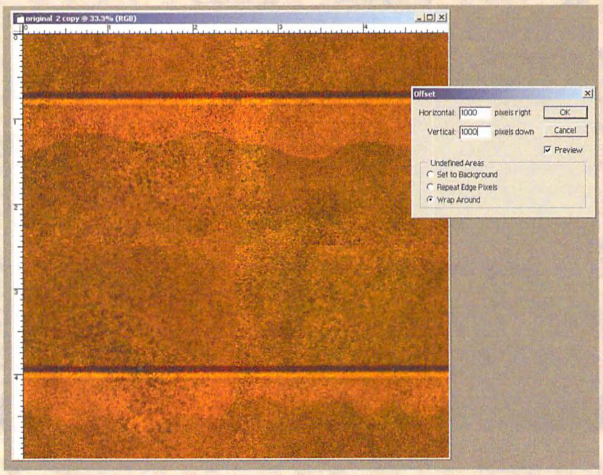
Create a new layer and name this one "Highlight Grout." Your foreground color will be white and you will duplicate the same procedures as in step 1, but this time place your line adjacent to the black one just below it and change the layer mode to Overlay. Now our texture is starting to take on a more 3D effect.

Step 3

Sample some color from your image and create a new layer. Draw some dripping effects beneath one of the white line layers and change the layer mode to Color Dodge. Now, do the same for the other line.

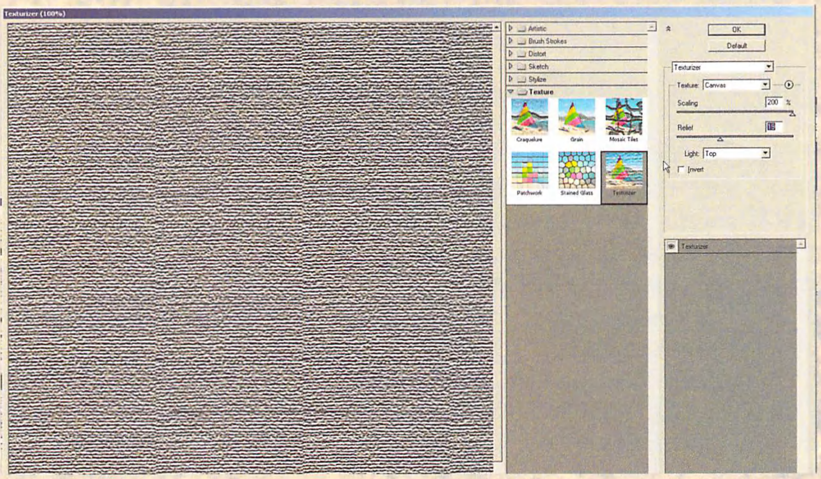
Step 4

We have a file with dimensions that are 2000 x 2000 pixels. It's time to ensure that we can tile this texture. Access Filters>Other>Offset and place 1000 in both the width and the height. This is in essence splitting your file in half and placing the halves head to head so that we can see how the detail flows when it is tiled. As you can see in this example, the edges of the files are visible, so we will need to apply both the Clone and



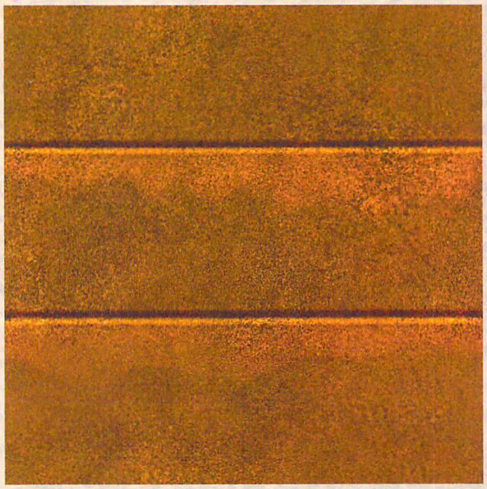
Horizontal: 1000 pixels right
Vertical: 1000 pixels down
☑ Preview
Undefined Areas
○ Set to Background
○ Repeat Edge Pixels
● Wrap Around

wall texture04.tif



Texture: Canvas
Scaling: 200 %
Relief
Light: Top
☐ Invert

Brush07.tif



wall final.tif

Healing Brush tool to patch up the defects. Once you are done editing, apply Offset again and you should have your image just the way it was before, except it will tile seamlessly. [wall texture 04tif]

Step 5

All that needs to be done now is to flatten the file and save it to a format that we will apply in LightWave. We have created an image with a limited color palette. We really don't need a 24-bit RGB file. So let's reduce the file by indexing the colors to only 256 maximum and save it as a Targa or PNG format (Image>Mode>Index Color). This will greatly reduce the file size for more efficient rendering times. [wall final.tif]

CREATING THE BURLAP TEXTURE

We are going to add a variation on the theme and use the base texture for the wall and add some of Photoshop CS filter effects to give us our burlap feel.

Step 1

Create a new layer above your texture and fill it with a medium gray (Edit>Fill).

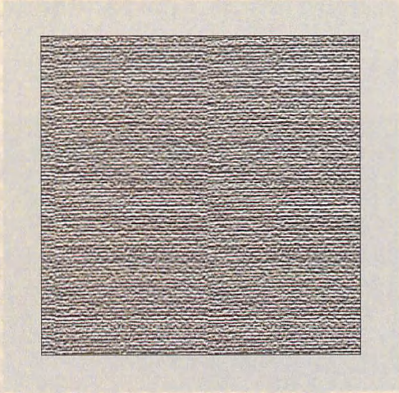
Step 2

Access Filter>Texturizer and select the canvas filter. Make the effect pronounced by increasing the relief percentage and increase the size of your texture to 200%. Click OK. As you can see, the new Photoshop CS allows us to preview all of our textures before we commit the changes. You can add more textures on top on one another and change they affect each other as well. [Brush 07.tif]

Let's look at the final texture. [Brush 08.tif]

Step 3

While still in the textured medium gray layer, change the layer's blending mode to Overlay. What happened here! This layer mode makes all medium gray pixels transparent and will not affect the highlights or shadows. So as an end result we get a 3D raised texture look. Flatten all of the layers and duplicate the background layer. [Brush 09.tif]



Brush08.tif

Step 4

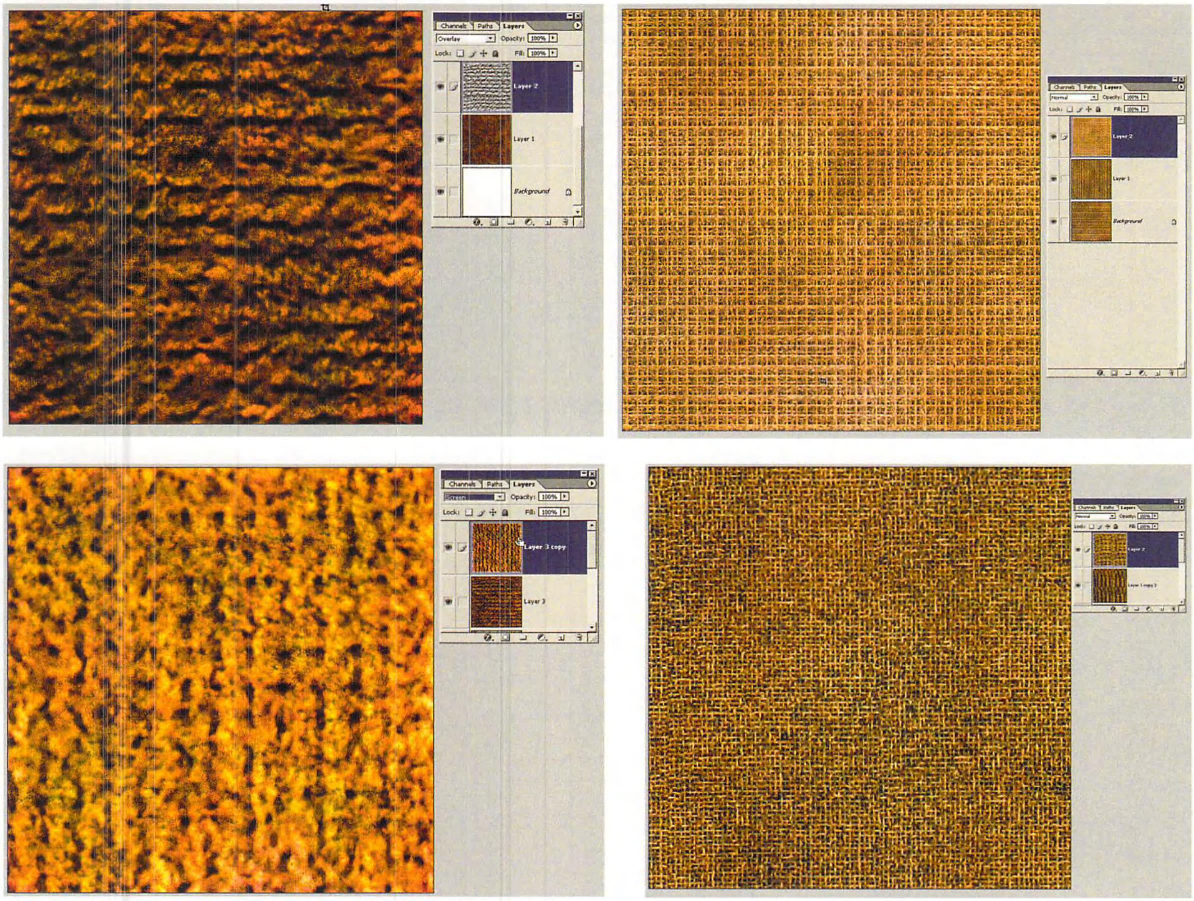
Change the layer blending mode of the top layer to Screen. Wow! Instant weave pattern! [Brush 10.tif]

By varying the texture on the medium gray layer we created in Step 3, we can get all types of weave effects. A couple of other examples are Brush 11.tif & Brush 12.tif.

CREATING THE FLOOR

I wanted to keep the flow of the theme consistent, so I used the same techniques used to create the wall, but this time used different brush shapes and sizes to vary the look. A WACOM tablet is excellent for this type of work, in that you can set the animated texturing properties to adjust with the pressure of the pen. My final image looked something like Concrete01.tif.

Don't forget to make it seamless in case you choose to tile the texture.



Clockwise from top left: Brush09.tif, Brush10.tif, Brush11.tif, and Brush12.tif.

CREATING THE BUMP, SECULAR AND DIFFUSE MAPS

I am going to use the wall to discuss creating bump, diffuse and secular maps. This approach was used for the other surfaces as well.

CREATING THE BUMP MAP

Step 1

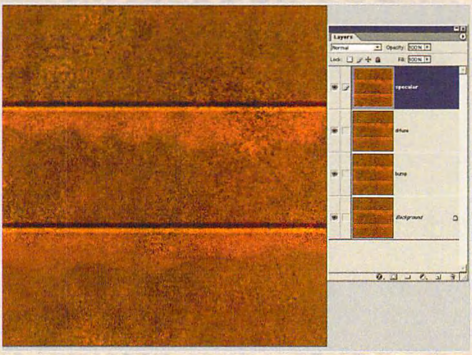
I find it advantageous to always work in layers. After opening my final wall texture I duplicated the layers 3 times and named each one specular, diffuse and bump respectively. Let's start by talking about the bump map. [surface 01.tif]

Step 2

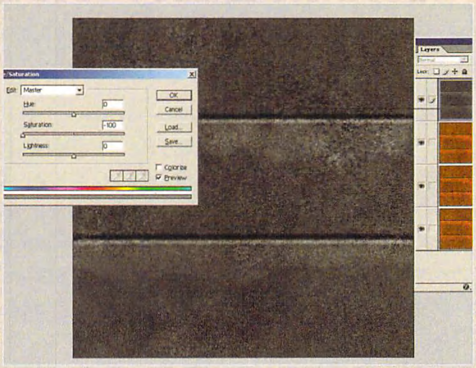
Surface properties use the different tonal ranges of gray to create the raised 3D effect. For the bump channel in LightWave, the tonal information that is closest to black creates the recessed values and the information that is closest to white creates the relief. I begin by accessing my Hue & Saturation (Image>Adjust>Hue&Saturation) and take the saturation slider all the way to the left to exclude all hue out of my image. As you can see, I am left with a great amount of midtone. So let's separate them out to isolate the lower and brighter tones more effectively. [surface 02.tif]

Step 3

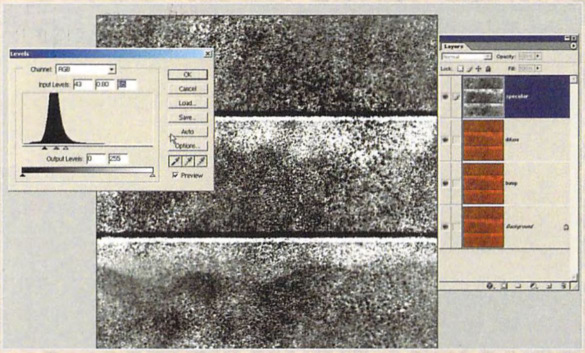
Access Levels (Image>Adjust>Levels) and move the white and black slider at the base of the histogram until the areas of the image that you want raised have brighter tonalities and the areas that you want recessed have darker tonalities. There is no right answer here. You play with the sliders until you get the results that you want. There is no substitute for pure experimentation. So play often. [surface 03.tif]



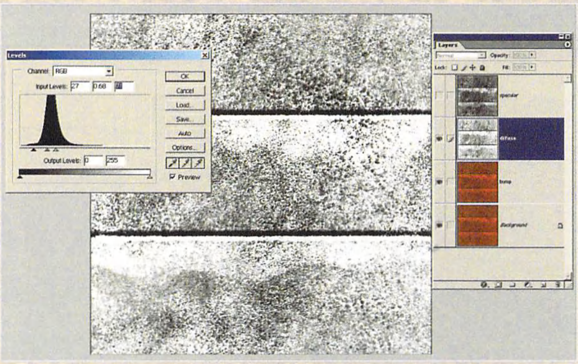
surface01.tif



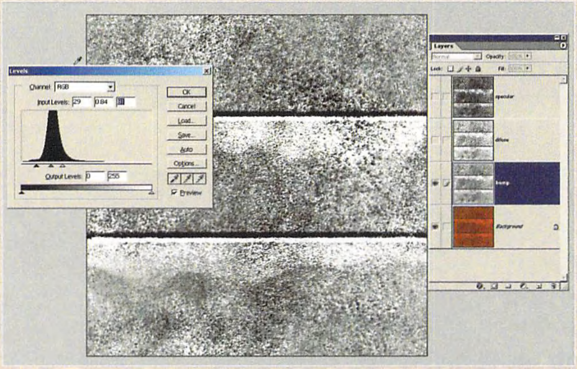
surface02.tif



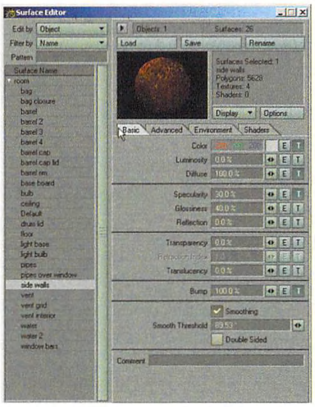
surface03.tif

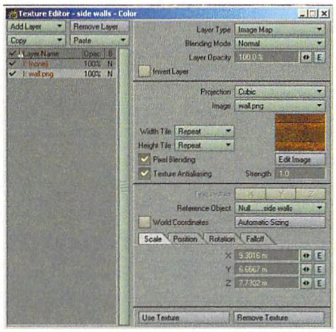


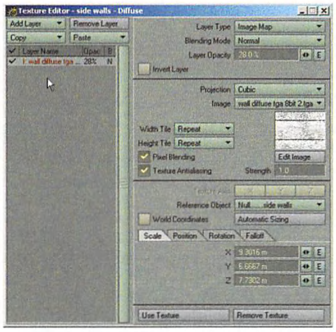
surface04.tif

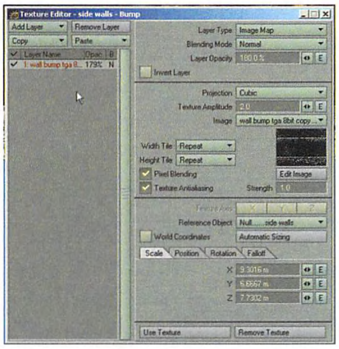


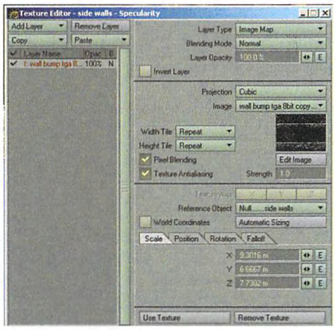
surface05.tif











Counter-clockwise from upper left: panel01.tif, panel02.tif, panel03.tif, panel04.tif, and panel05.tif.

CREATING THE DIFFUSE MAP

Step 1

Click the eyeball symbol to the left of specular layer to turn off the visual aspects. Now select the diffuse layer and apply steps 1 thru 3. Understand that the areas that are closer in black will increase the density of your surface in LightWave. This can give your surface some real character as you decide what areas of your image have depth and what will tonally jump out toward your spectators.

Step 2

Apply steps 1 & 2 from the bump map procedures to get the gray scale information.

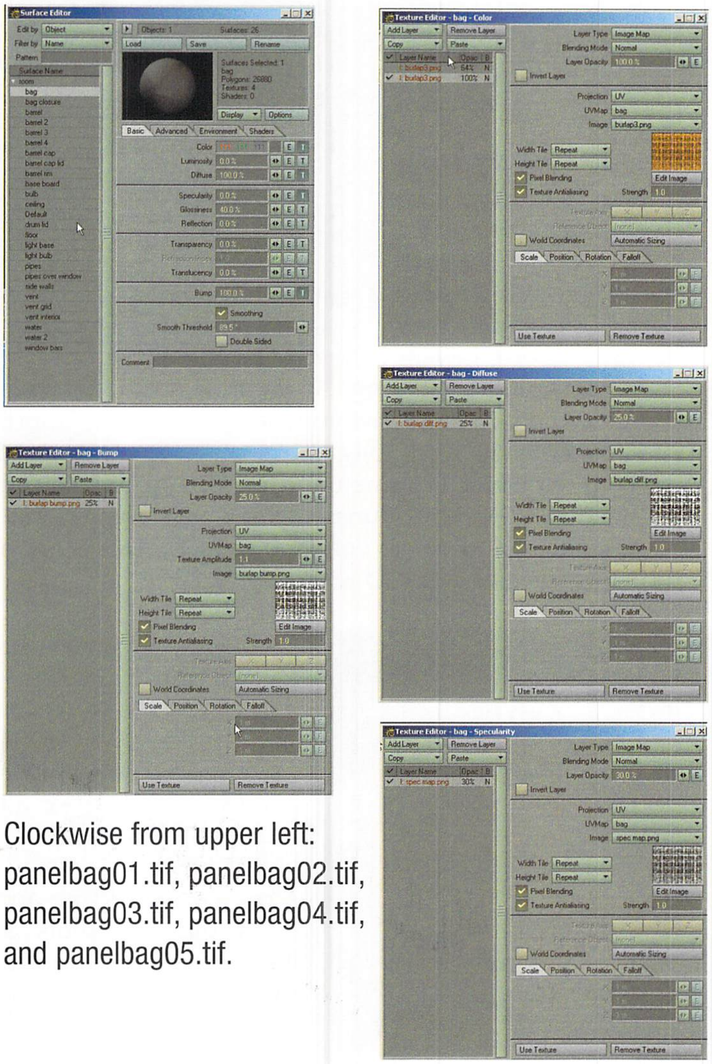
Step 3

Finally, apply levels so that only the areas that you would like to be richer will have the lower tonal information in them. The rest should be close to white. Remember...experiment. [surface 04.tif]

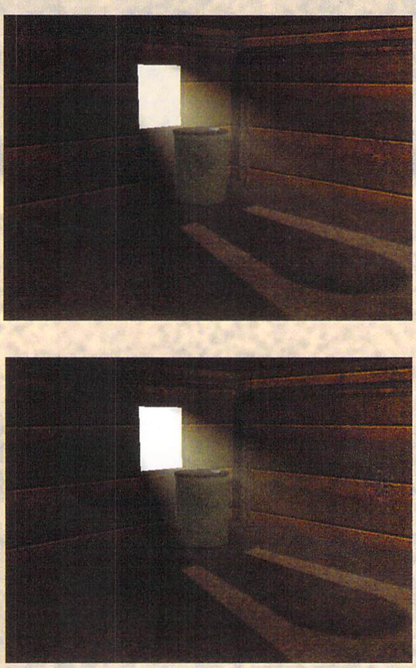
CREATING THE SPECULAR MAP

Repeat all of the above steps, but this time keep in mind that your image will be more specular in the highlights. Use the levels to reflect this. [surface 05.tif]

All that needs to be done now is to apply them onto our surfaces in LightWave. I have provided screenshots of my surfaces to give you insight as to what settings I applied to my surfaces. Next issue we will look at applying and altering photographic textures in Photoshop.



Clockwise from upper left: panelbag01.tif, panelbag02.tif, panelbag03.tif, panelbag04.tif, and panelbag05.tif.



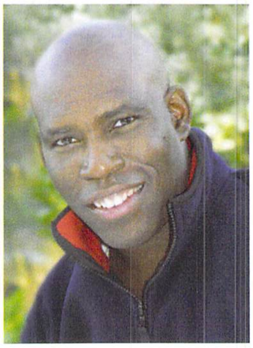
Barrell renders

SURFACE EDITOR SCREENSHOTS FOR THE WALLS

Panel01.tif is the main panel and supporting screen shots are Panel02.tif, Panel 03.tif, Panel04.tif, and Panel05.tif.

SURFACE EDITOR SCREENSHOTS FOR THE BURLAP BAGS

Panel bag 01.tif is the main panel and supporting screen shots are Panel bag 02.tif, Panel bag 03.tif, Panel bag 04.tif, and Panel bag 05.tif. 🟥



STEPHEN BURNS HAS DISCOVERED THE SAME PASSION FOR THE DIGITAL MEDIUM AS HE HAS FOR PHOTOGRAPHY AS AN ART FORM. HIS BACKGROUND BEGAN AS A PHOTOGRAPHER 22 YEARS AGO AND IN TIME, PROGRESSED TOWARD THE DIGITAL MEDIUM. STEPHEN HAS BEEN A CORPORATE INSTRUCTOR AND LECTURER IN THE APPLICATION OF DIGITAL ART AND DESIGN FOR THE PAST 8 1/2 YEARS. HE HAS BEEN EXHIBITING DIGITAL FINE ART INTERNATIONALLY AT GALLERIES SUCH AS DURBAN ART MUSEUM IN SOUTH AFRICA, CITIZENS GALLERY IN YOKAHAMA, JAPAN, AND CECUT MUSEUM OF MEXICO TO NAME A FEW. PART OF HIS EXHIBITING WON HIM 1ST PLACE IN THE PRESTIGIOUS SEYBOLD INTERNATIONAL DIGITAL ARTS CONTEST. OWNER OF BURNS DESIGN, HE TEACHES DIGITAL MANIPULATION WORKSHOPS IN THE SAN DIEGO AREA AND NATIONWIDE. HIS TEACHING STYLE COMES FROM HIS ABILITY TO SHARE AN UNDERSTANDING OF PHOTOSHOP SO THAT THE STUDENT HAS THE ABILITY TO INTUITIVELY APPLY IT TO HIS/HERS CREATIONS.

SLEEP? WHAT'S THAT?

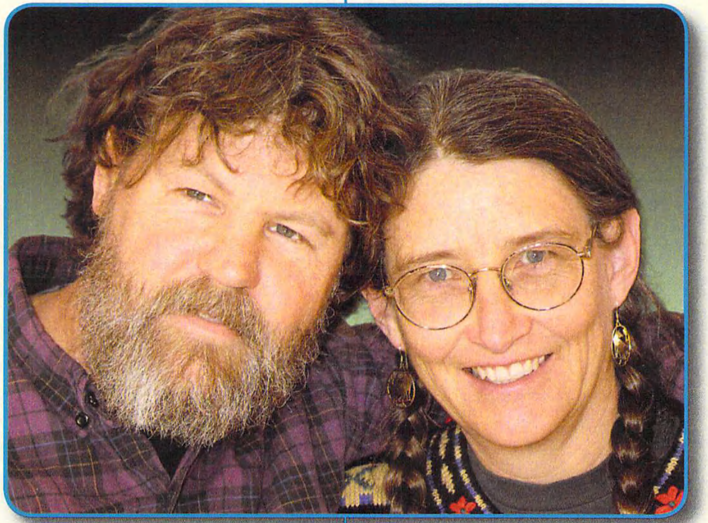
BY BRAD CARVEY

BRAD AND ANDREA CARVEY HAVE BEEN DOING COMPUTER ANIMATIONS FOR A LONG TIME. IN 1969 BRAD USED AN ANALOG COMPUTER, WHICH WAS THE SIZE OF A CAR, TO PRODUCE HIS FIRST COMPUTER ANIMATION. ANDREA, AN ARCHEOLOGIST, PREFERS TO DO SCIENTIFIC ANIMATIONS; HER CREDITS INCLUDE PROGRAMS LIKE DISCOVERY CHANNEL'S "UNDERSTANDING CARS." BRAD IS AN ELECTRICAL ENGINEER AND AN EMMY AWARD-WINNING MEMBER OF THE VIDEO TOASTER DEVELOPMENT TEAM. HE PREFERS TO DO FEATURE FILM WORK. HIS CREDITS INCLUDE FILMS LIKE "MEN IN BLACK," "STUART LITTLE," "BLACK HAWK DOWN," "KATE & LEOPOLD" AND "MASTER OF DISGUISE."

When do *I* get to sleep?

If you are thinking of becoming a 3D graphics artist and you enjoy your sleep, you may want to consider another profession. As a freelance Hardware/Software Engineer and computer graphics artist, I don't get a lot of sleep. Fortunately, I don't need much.

I realized early on that I slept less than the rest of my family. I would lay awake puzzled by things like infinity. How could space keep going forever, but then again, how could it stop? Is the absence of something nothing? Can nothing be nothing, or is it something? If I move half of the distance to the wall, theoretically I will never reach the wall, but I seem to get to the wall rather quickly. How does this work? All this while my brother obliviously slumbered away.



In fourth grade, I drilled a small hole in the wall of my bedroom so I could see the TV in the family room. My dad eventually noticed the hole and caught me watching. After some discussion it was decided that I could stay up as late as I wanted if I was reading. That night my dad came in at 2 a.m. to tell me to stop reading and turn out the light. That was the last night I got to read "legally" late at night.

As a kid, I was affected by a quote in the movie "Journey to the Center of the Earth" (the 1959 version with James Mason and Pat Boone, not the 1999 version with Treat Williams). In the movie, there was an arch-rival and evil scientist named Count Saknussem who did not appear to sleep. When questioned about this, Saknussem said, "I never sleep. I hate those tiny little slices of death"! To me this was a revelation! It was possible that some people actually needed less sleep than others. I felt that I was one of those.

It has been beneficial in both my engineering and 3D computer artistic endeavors. However, it has been the 3D that has tested my limits to the max.

As an engineer, I worked at Sandia Labs here in Albuquerque, New Mexico, and for a while, also worked at Commodore Amiga in Los Gatos, California on occasional weekends. I would leave work at Sandia National Labs for an early evening flight to the Bay Area, drive to Commodore Amiga's headquarters, and work in their development lab non-stop until Sunday afternoon. I would then fly back to New Mexico for a well-deserved rest before I went to work in the morning. At the time, I thought that three days and two nights without sleep was pretty impressive. Engineers do work long, hard hours to make deadlines, but their brains become unproductive before they actually need to sleep. Unfortunately, they need their brains to be functional in order to continue to work. This is not necessarily the case with 3D work.

While working on the Tom Clancy movie "Net Force," I was able to do lip sync animation for five days with almost no sleep. I had a deadline, and I wanted to go to a family reunion. I got a total of about eight hours of sleep from Monday to Friday, and Fed Ex'ed the final shots on the way to the airport. I was able to keep working because after the initial set up work, most of the time was spent doing repetitive, brainless tasks.

Everyone has deadlines. Many of us lose sleep trying to meet them, but 3D artists have a problem most other professionals don't have. The big problem is that you should only sleep while the computer is working. Before stopping, it's important to finish a scene, so the computer can render it while you are sleeping. So, if you are like many of the best artists, who are often not satisfied with their work until it is perfect, you can spend endless hours refining, constantly trying to improve the final render. This makes the "Big Problem" worse. You want to start rendering so you can quit, but something always needs a little change. It's only a deadline, an inability to physically keep your eyes open, or the intervention of others that forces you to stop tweaking.

2 a.m.? Sorry Andrea, I can't go to sleep yet, "I don't like the shade of yellow on the logo of this cigarette lighter. It'll only take a minute..."

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